INDIA RUBBER WORLD

FOUNDED 1889

CAOUTCHOUC Reg. U.S. Pat. Off.

GUTTA-PERCHA Reg. United Kingdom.

Published on the 1st of Each Month by

THE INDIA RUBBER PUBLISHING CO.

DIVISION OF EDWARD LYMAN BILL, INC.

25 West 45th Street, New York, N. Y. Cable Address: Irworld, New York

HENRY C. PEARSON, F.R.G.S., *Editor*

Volume 75 MARCH 1, 1927 Number 6

Contents

	Pages
Editorials	312
Rubber Compounding	313
The Revertex Process	315
Rubber Compared to Steel	317
Tetraline Solvent Recovery Process	319
Inquiries and Trade Opportunities	320
Rubber in Universal Joints	321
Clay Blown Tires	322
Legal Decisions	322
Automotive Rubber Goods Exports	323
Effective Fire Prevention in Rubber Factories	325
American Rubber Technologists	326
What the Rubber Chemists Are Doing	327
Chemical Patents	328
Cord Tire Fabrics	329
New Machines and Appliances	331
Process Patents	333
Machinery Patents	334
Book Reviews	335
Abstracts of Recent Articles	336
New Trade Publications	336
New Goods and Specialties	337
Obituary	340
Financial and Corporate News	341
New Incorporations	342
The Rubber Industry in America—News and Personals	343
Seventh International Rubber Exhibition	351
The Rubber Industry in Europe—Trade Notes	353
The Planting Industry in the Far East—Malaya, Netherlands East Indies	355
Patents, Trade Marks, Designs and Labels	357
Statistics from the Rubber Association Covering the Fourth Quarter of 1926	359
The Rubber Exchange of New York, Inc.—First Annual Dinner	372
Markets	
Crude Rubber—Monthly Review	360
Rubber Exchange—Monthly Review	362
Reclaimed Rubber	363
Scrap Rubber	364
Metal	364
Compounding Ingredients	365
Cotton and Fabrics—Monthly Review	367
Statistics	
United Kingdom Rubber Statistics for December, 1926	369
London and Liverpool Landings, Deliveries and Stocks	369
Canada, Statistics for November, 1926	369
Ceylon Rubber Exports from January 1 to December 7, 1926	371
Malaya, British, Rubber Exports	371
United States	
Crude Rubber Imports, Consumption and Stocks	363
Crude Rubber Arrivals at New York as Reported by Importers	370
Custom House Statistics	371
Statistics for Eleven Months Ended November, 1926	371
Advertisers' Index ...Advertising Page	102
Classified Advertisements Advertising Pages	62- 68
Buyers' Directory ...Advertising Pages	76-100

Copyright, 1927, by The India Rubber Publishing Co.

Subscription $3.00 Per Year Postpaid in the United States

$3.50 Per Year Postpaid to All Other Countries

EDITORIALS

Financing Retail Tire Buying

Of all the trade developments of 1926 perhaps none was more striking than the growth of the retail instalment business. It is estimated that the value of goods bought on time last year easily exceeded $5,000,000,000, of which automobile sales accounted for fully $3,259,000,000. Economists say that it is largely through buying things they have not the money to pay for, and the newer modes of consumer financing that the American people have, in a quarter of a century, increased their national wealth from $88,000,000,000 to $350,000,000,000. Certainly it is through an expansion of credit which would appal old-time financiers that the automobile industry has been able to effect the wonderful economies of mass production; and the latter is not possible without mass consumption.

True, the buyer may pay 8½ per cent, or $127.50, for the privilege of taking a year to pay for a $1,500 car, but if he were unwilling to pay such handling cost and thus supply funds to make mass production possible the car would cost him 20 per cent more, or $1,800. So, too, a $750 car, now costing 11 per cent to finance, would probably cost even more proportionally, perhaps $950.

Old school manufacturers have found it hard to believe that production can be financed just as soundly by creating assured demand for goods which can be readily provided as by supplying funds directly for the production of goods for which a market must be found. The automobile industry has proved that the converse as well as the obverse of the old trade rule is logical and practical. Overstocking, with its danger in a panic and its tying up of retailer capital, now gives but little anxiety, production is stabilized as never before, and buying power is vastly increased. It is said that automobile paper withstood the depression of 1921 even better than most forms of credit, and that risk averages can be figured almost as accurately as those of life insurance.

While fairly keeping pace with automobile manufacturing during the latter's astonishing expansion within the past fifteen years, the rubber industry has, however, adhered to a more conservative policy than the younger industry. To what extent this has been justified is a debatable question. Many large and enterprising tire makers still appear to doubt the advisability of encouraging the distribution of their products on the instalment plan so popular among motor car builders. Yet the latter have amply demonstrated the safety, sanity, and feasibility of the pay-as-you-ride proposition: and many retailers, including great mail order concerns, are successfully making sales on such a basis.

The time appears ripe for tire manufacturers to plan as a whole and profit by the experience of automobile makers. They are resourceful enough to formulate a general scheme of consumer financing that would serve every proper requirement, and it should inure not only to their considerable advantage but to the benefit as well of the entire rubber industry.

* * *

Thomas Edison Our Benefactor

On February 11 the electrical industry celebrated the 80th birthday anniversary of its great master and founder, Thomas Alva Edison. Hundreds of lighting and power companies, countless enterprises and many industries which owe their inception to the genius of this greatest of American inventors recalled their indebtedness to this foremost of living Americans.

Homage was paid to Mr. Edison wherever electricity is used, whether in the home circle, in industry or in the daily routine of business, and grateful humanity acclaimed him as one of the greatest benefactors of the human race.

Mr. Edison is still enjoying good health and is busy every day in his laboratories in Orange, devoting himself energetically to investigation, experimentation, and research. Let us hope that he may continue in good health and happiness and thus be spared for many more years of useful activity for the benefit of mankind.

* * *

A NUT THAT CAN NOT BE CRACKED IS BEING BOUGHT FOR free distribution by a big western walnut growers' association. This concern having had much trouble with sample walnuts on advertising plaques drying and splitting, got a rubber artificer to duplicate them in soft rubber with mineral coloring. The rubber nuts, fine replicas of the large budded specimen, are attached to the panels by means of brass clamps like those used on legal papers and vulcanized in the rubber. It is stated that the rubber walnuts having proved very satisfactory are being produced in large quantities.

* * *

THE HOME MARKET SEEMS LIKELY TO REMAIN A LONG time the main reliance of American rubber manufacturers. A United States Department of Commerce report states that this country's consumption of American-made rubber goods still keeps above 95 per cent of the total output. In contrast, according to the same report, British rubber manufacturers have to push sales strenuously overseas as the home demand takes scarcely half of their products.

Rubber Compounding[1]

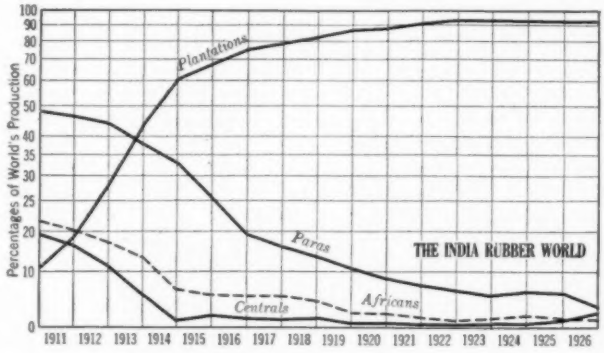
Comparative Importance of Plantation and Wild Rubber Supply— Market Grades and Descriptions

Webster Norris

THE plastic gum base of every technical rubber mixing binds together the other ingredients and is the principal factor in determining its technical value. This base may consist of crude rubber or reclaimed rubber separately or of blended grades of either or both. The selection and proportions of gums for a mixing are made with reference to volume cost, workability and serviceability of the stock.

These results measure the success of the work of the compounder and rest in the first instance on his knowledge and experience with crude rubbers.

Before the days of plantation rubbers the compounder was perplexed by the great variety of crude rubbers offered in the market. Their number was 50 or more, ranging downward in quality from hard fine Para to the soft rubbers from Africa and Borneo. The successful development of the plantation rubber industry reached in 1910 an output representing 11½ per cent of the world's rubber supply for that year. Its superiority, however, had been fully established previously and thenceforward it rapidly outstripped the production of all other grades. In 1914 it constituted 60 per cent of the total production while Paras were scarcely 33 per cent. In 1921 plantation rubbers exceeded 90 per cent of the world's output and since then they have averaged nearly 94 per cent. Of the remainder, Paras constitute 5 per cent and Centrals and Africans about one per cent each. This rapid transformation of the rubber supply from wild sorts to plantations has greatly simplified the task of the chemist and compounder and amounts to practical standardization of qualities. Compounders now favor wild rubbers only when they are cheaper than the equivalent plantation grades, for special technical reasons, or to maintain strictly the identity of some long established mixing.



Percentages of World's Rubber Production, 1911-26

The following table of percentages from which the accompanying graph is plotted was derived from United States official statistics[2].

The transformation indicated by these figures is shown graphically in the chart which makes strikingly evident the dominating importance of plantations in the world's rubber supply. The rapidity with which this position was attained is particularly evident in the strong divergence of the curves for plantations and Paras for the years subsequent to 1913 in which year their relative proportions were alike. The disparity of their proportions has averaged over 90 per cent every year since 1922. Central American and Mexican sorts fell off even more rapidly than Africans. They have averaged only one per cent since 1914. Africans were not reduced to that ratio until seven years later but they are now off the market list, although odd lots and grades can be bought, particularly in Europe.

PERCENTAGES OF WORLD'S RUBBER PRODUCTION BY GENERAL PRODUCING REGIONS

Year	Plantations, Per Cent	South America, Per Cent	Central America and Mexico, Per Cent	Africa, Per Cent	Total, Per Cent
1910	11.4	48.0	19.0	21.6	100
1911	18.5	46.0	16.0	19.5	100
1912	29.0	43.7	10.7	16.6	100
1913	44.5	37.0	5.25	13.25	100
1914	60.5	32.5	.75	6.25	100
1915	68.0	25.5	1.75	4.75	100
1916	75.3	18.5	1.07	4.90	100
1917	79.5	15.8	1.00	3.7	100
1918	82.5	13.0	1.25	3.25	100
1919	87.0	10.5	.50	2.0	100
1920	89.0	8.5	.50	2.0	100
1921	92.0	6.7	.13	1.20	100
1922	93.5	5.8	.10	.60	100
1923	93.5	5.2	.30	1.00	100
1924	92.5	5.8	.30	1.40	100
1925	92.5	5.50	.75	1.25	100

Familiarity with the characteristics, physical and curing properties of these rubbers, is essential for their use to best advantage. The form, color and general physical condition, as received, are distinctive for each sort. Comparison of crude rubber costs and qualities can be made satisfactorily only on a washed and dried basis. The technical quality of a rubber is judged by comparison of its physical properties at optimum or best cure with those of standard ribbed smoked sheets under parallel conditions. These properties vary greatly in the different types of rubber owing to their botanical origins and resin contents. Plantation or wild Para ranks first, followed by Centrals, guayule and Africans. The tabulation on the next page gives the botanical sources and ranges of resin content of current market rubber types.

CRUDE RUBBERS IN THE NEW YORK MARKET

PLANTATION HEVEA
- Rubber Latex (Hevea)

CREPE
- First Latex Crepe
- Off Latex, Spot
- Amber No. 2
- Amber No. 3
- Brown, Thin, Clean
- Brown Specky
- Brown, Roll
- Sole Crepe

SHEET
- Ribbed, Smoked

PONTIANAK
- Banjermassin
- Pressed Block
- Sarawak

PARAS
- Upriver, Fine
- Upriver, Medium
- Upriver, Coarse
- Islands, Fine
- Acre, Bolivian, Fine
- Beni, Bolivian
- Madeira, Fine
- Peruvian, Fine
- Tapajos, Fine

CAUCHO
- Upper Caucho Ball
- Lower Caucho Ball

MANIÇOBAS
- Ceará Negro Heads
- Ceará Scrap
- Maniçoba, 30% Guarantee
- Mangabeira, Thin Sheet

CENTRALS
- Central Scrap
- Central Wet Sheet
- Corinto Scrap
- Esmeralda Sausage

GUAYULE
- Washed and Dried

GUTTA PERCHA
- Gutta Siak
- Gutta Soh
- Red Macassar

BALATA
- Block, Ciudad Bolivar
- Colombia
- Panama
- Surinam, sheet
- Surinam, amber

[1]Copyright, 1927, by Webster Norris. Continued from THE INDIA RUBBER WORLD, January 1, 1927, pp. 189-90, and February 1, 1927, p. 258.

[2]Special circular No. 1370, Rubber Division, Bureau of Foreign and Domestic Relations of the Department of Commerce, Washington, D. C.

RESINS IN CRUDE RUBBER TYPES

Types	Resins, Per Cent	Botanical Sources
Plantations	1.5- 2.5	Hevea
Paras	1.5- 2.5	Hevea
Centrals	3.0- 7.0	Castilloa
Africans	4.5-10.5	Landolphia
Guayule	20.0-25.0	Parthenium

Crude Rubber Types

Hevea latex is preserved from coagulation by the presence of a small percentage of ammonia. It contains 30 per cent dry rubber which is obtained as "sprayed latex" rubber by a patented process of spraying and drying[a].

In this form it can be manufactured like any dry rubber. Latex can be concentrated, compounded and vulcanized, in which forms it is being applied technically.

First latex Hevea rubber comes in clean thin creped sheets unsmoked and free from discolorations or impurities of every sort. As a rule it sells slightly above the price for ribbed smoked sheets because of its pale color which adapts it for white and delicately tinted goods.

Off latex crepe is unsmoked, not as light in color as first latex and is of slightly lower quality.

Ambers are unsmoked, thick crepes worked up from native plantations. They are a soft blending quality. No. 2 is lighter in color than No. 3, although the latter is not as dark as smoked rubber or the brown crepes. It is somewhat lower in tensile properties than the off latex grade. Ambers are acceptable for a wide range of blending and compounding.

Brown crepes are of three grades, thin clean, specky and roll. They are worked up from the factory accumulation of scrap coagulum. They are all unsmoked, their brown color results from the exposure of the coagulated material to sunlight the action of which on the sensitive material produces the dark color. In quality they grade downward. Thin clean is the best and roll brown poorer quality. Thin clean brown has very good quality, ranking under that of off latex.

Specky brown is specky with bark trimmings or other impurities, which lower its market value if not its actual rubber quality.

Roll brown is the softest of the crepes. Following its preparation the sheets originally were rolled and shipped in cases. Now this rubber is folded and marketed packed flat in mats. The term "Roll" is retained as its market designation despite failure to indicate its present market form, because the quality of the rubber continues unchanged. "Roll" serves only to name the grade, the quality of which is variable. It is used in footwear and other lines for frictions.

All the brown crepe grades should be washed before compounding. Being more or less soft they blend well with stronger rubbers for friction purposes.

Sole crepe is of the same quality as first latex crepe. It is unsmoked and specially prepared for shoe soling purposes for which it is used uncompounded. Very little sole crepe in the domestic market is prepared as such on the Far Eastern plantations. Practically all of it is prepared in American factories by remilling first latex crepe to standard thicknesses.

Standard ribbed smoked sheet is the stable grade in both the outside and the Exchange markets. It differs from first latex in that it has been consolidated by sheeting between rollers which impress the rubber with a ribbed effect of special design for each estate. It is then exposed to the smoke of wood fires confined in drying sheds. The absorption of the smoke gives the rubber a dark color but otherwise does not alter its technical properties.

Fine Para was the premier grade of rubber until plantation Para was perfected and it still shares with the latter that distinction. It comes in the form of balls or ham-like shapes built up in thin films or layers on a bar of wood as a center. The successive applications of latex are coagulated in the smoke of burning nuts issuing from a rude clay furnace and thus the ball of rubber is enlarged. The Para grades are known as fine, medium and coarse. These are further designated as upriver, islands and by the names of the tributaries of the Amazon where they originate. Special upriver grades come from Peru, Acre, Bolivia, etc. Fine Paras from these various sources do not vary greatly in cost. The higher prices are paid for the upriver grades including those from Acre, Bolivia and Peru because of their superior quality, uniformly clean dry condition, giving minimum shrinkage on washing and drying.

Caucho comes in balls of two grades, upper and lower, these terms indicating its preparation from the upper and lower reaches of the rivers in Bolivia and Brazil. Its coagulation is effected by means of soap or astringent sap. The balls are built up of strips and scraps. The rubber is of good quality and is well esteemed for mechanical goods and hard rubber molded work.

Manicoba rubber is marketed as Ceara negro heads and scrap; manicoba 30 per cent guaranteed shrinkage, and mangabeira thin sheet. Ceara negro head is coagulated by air drying as scraps which are afterwards formed into balls. Scrap is also washed and marked as such.

Centrals, otherwise Central American sorts, are scrap, sheets, Corinto scrap and Esmeralda sausages. These rubbers are strong types, useful in general work and rate below coarse Para in tensile properties.

Guayule rubber occurs as such in the root, stem and branches of the guayule shrub. It contains a naturally large admixture of soft resins. When this is extracted the rubber is of excellent quality and good curing property, comparable in fact, to standard ribbed smoked sheets. As a source of cultivated rubber, guayule doubtless has great potential importance. Its propagation and cultivation are now the subject of scientific study. This has led to great expectations of its ultimate development as a cultivated grade rivaling plantation rubber in cost and quality.

African rubbers are of very minor interest today. They are usually more or less soft and resinous. For that reason they were formerly esteemed for friction in footwear, medium grade hose, etc. They find occasional use for special purposes where their soft adhesive quality is needed as in the manufacture of friction tape.

Gutta percha is very plastic when warm and hard when cold. It is used almost exclusively as insulation in submarine cables and not in rubber compounding.

Balata is inferior to gutta percha which it resembles and is similarly worked. It is sometimes used in rubber compound for special purposes. In its deresinated form it is largely used for making covers for golf balls.

Pontianak is a low grade, very resinous rubber, and comes in several market grades but no longer holds its former interest for the rubber industry. In recent years the supply has been diverted to the manufacture of chewing gum.

An important saving by the elimination of rubber washing and drying machinery resulted from the displacement of wild rubbers by plantations. Thus there is a great saving in factory rubber carrying charges and less uncertainty as to the cost of a given lot of rubber.

Plantation grades, crepe and sheets, have displaced all others in the proportion of over 9 to 1 in the industry. In many American factories no wild rubber is used, not even fine Para for two main reasons. First, lack of washing and drying facilities; second, they are economically available only when, washed and dried, they show a favorable price differential over equivalent plantation grades.

The technology of rubber began with the scientific work done in the development of plantation rubber. The chemist and compounder should not fail to familiarize himself with its leading features, thereby enlarging his knowledge of its nature, properties and possibilities in compounding, processing and curing. It is safe to say progress was greater along these lines within the past 15 years than in the entire previous history of the rubber industry.

[a] "Manufacture of L. S. Crude Rubber," THE INDIA RUBBER WORLD, June 1, 1923, 553.

The Revertex Process[1]

Principles, Operation, Applications, and Advantages of Concentrated Reversible Latex

DIFFICULTIES of preservation and transportation long prevented the application of latex for industrial purposes. The possibility of preserving latex by the addition of an alkali was patented and generally known about the middle of the last century, but only in recent years has the interest in the direct application of latex resulted in new and constantly growing development.

Concentrated Latex

The highly concentrated latex prepared for industrial uses by the concentration process here described is known by the trade marked name Revertex, meaning reversible latex. Revultex denotes vulcanized latex of any concentration produced from Revertex. Freshly tapped latex contains an average of 30 per cent of rubber substance. Its transportation involves carrying two-thirds of its weight of water as ballast.

During the past few years several latex concentration methods have been worked out. These are: (1) mechanically by centrifugation and filtration, or ultra filtration through porous diaphragms, (2) by creaming up, and (3) by evaporation.

Both the centrifugal, and the creaming process, as far as known, have the disadvantage that an absolutely complete separation of rubber substance and serum is not possible, so that a certain percentage of rubber must be regained by other means. The filtration process has the disadvantage that although a complete separation is possible, the concentrates obtained are very sensitive toward pressure and further evaporation, as the protective constituents contained in natural latex remain in the serum to a large extent. As regards evaporation processes one must differentiate between those that allow obtaining a certain concentration while constantly adding ammonia, and those that vastly stabilize the latex through an addition of protective colloid so that reversible evaporation can be carried out to nearly unlimited extent.

Revertex Process

The Revertex process is the only one referring to evaporation with the application of protective colloids which has been investigated and carried out in a large technical way. According to this process the latex, collected early in the morning, is strained, treated with a reagent of preservative effect and stored in large vessels until evaporated in specially constructed apparatus. Shortly before beginning its evaporation the necessary alkaline protective colloid is added to the latex.

The evaporation plant consists of a large rotatable cylinder with double walls, and shown in Figure 1. Hot water is constantly circulated through this wall space from a water heater. Within the water jacketed cylinder is a small free moving roller, seen in Figure 2, which is set in rotation by the movement of the main cylinder. During rotation the latex in the cylinder is distributed in thin coatings on the heated walls and evaporated. The movement of the inner roller insures constant and thorough mixing. A current of cold air passes through the apparatus, carrying off the vapors and preventing formation of a skin on the thin coatings of evaporated latex.

Evaporation is thus continued until the original latex assumes a paste-like consistency. This is the case when the water content is reduced to 20 to 30 per cent. The apparatus is stopped at this stage and the material is discharged into receiving vessels. After cooling it is filled into simple Venesta cases coated with a thin layer of paraffin and is then ready for shipment.

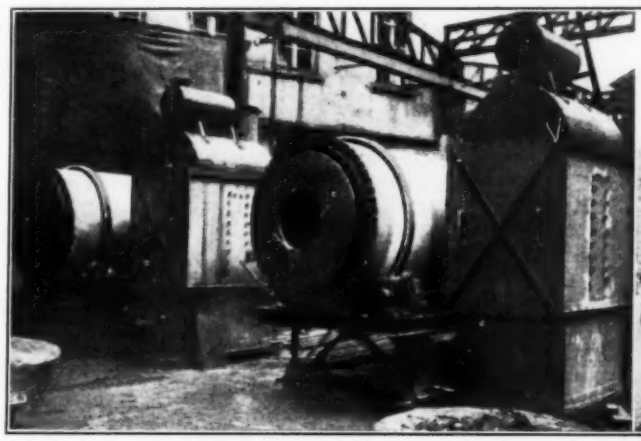


Fig. 1—Revertex Evaporation Plant

Fig. 2—Showing Interior Roller

The cost of the apparatus used is low in comparison with that for the machinery necessary in the production of crepe, smoked sheet or sprayed rubber. The cost can compete with that of the usual crude rubber production.

Application of Concentrated Reversible Latex

Owing to the fact that this material can be completely dispersed by the addition of ordinary water, its application is possible in all cases where liquid latex is used. It is dissolved by first adding about one-third the quantity of water required for the desired dilution and allowing it to stand from one-half to one hour. During this time the paste swells somewhat and very rapid and complete dispersion takes place when the remainder of the water is added. If the total quantity of water is added at once very intensive stirring is essential in order

[1]By Ernst A. Hauser in *Kautschuk*, January, 1927.

to obtain a uniform dispersion, otherwise lumps easily form which require further addition of water to affect their dispersion. It is well to test the completeness of the solution by pouring the liquid through a very fine sieve or muslin gauze. Latex of any desired concentration can be made by changing the quantity of water added.

The following are examples of its application: (1) coating woven fabrics; (2) impregnating after the web cord process; (3) manufacture of dipped goods; (4) impregnating yarn, thread, etc., (5) production of ready-made goods by means of electro-deposition on clay forms.

Vulcanized Latex

It is possible to vulcanize the rubber dispersed in natural or preserved latex. This process can be applied also in the case of redissolved Revertex. This liquid has increased stability because the protective colloid it contains continues to exist in the redissolved state. Like ordinary latex, it is suitable for the manufacture of pure rubberized fabrics and eliminates vulcanization after coating. The use of different alkaline fast colors is possible and solvent recovery is obviated since only evaporation of water need be considered. The goods produced are distinguished by their excellent physical properties. The reason for this is that in the course of production the rubber is not mechanically treated and the non-rubber constituents of natural latex are entirely preserved. According to the latest research this appears to be of first importance in the case of aging. The goods produced actually have superior resistance to aging.

Through a change of the vulcanization process Revertex can be vulcanized in the paste so that no superfluous sulphur remains. Thus vulcanized it can be applied in any desired concentration. After complete vulcanization the paste is turned out with approximately 35 per cent water content. This concentration is excellently suited for coating woven materials, production of dipped goods and particularly for the manufacture of plain sheets. These pastes possess excellent stability and easily receive fillers for obtaining mixes suitable for different purposes. When producing such mixes it is necessary to keep the water content at about 30 per cent during mixing. For the production of a mix as homogeneous as possible it is well to finish it through a colloidal mill before use. This process can be done without danger of coagulation owing to the great stability of the paste toward friction.

The following figures represent average values of pastes produced on a large scale:

E_{300} = 373 per cent
E_{600} = 497 per cent
E_{1040} = 597 per cent
E = 875 per cent
T = 336 kg. per square centimeter
S = 40

E_{300}, E_{600} and E_{1040} indicate respectively the elongation of the test specimen at loads of 300, 600 and 1,040 kilograms per square centimeter; E is the elongation at break; T is the breaking load; S is a coefficient of the difference between the stretch at 1,040 and 600 kg.

Production of Mixes

The quantity of Revertex paste corresponding to the required rubber content is placed in a horizontal enclosed mixer, having sloping walls to avoid unnecessary friction. If possible, the machine should be arranged for two speeds and reverse. A brushing sieve attachment is fastened to the lid of the machine for receiving the fillers. The sieve is set in motion simultaneously with the stirring blades. By this means the dispersion of the fillers into the paste is very uniform.

In the case of mixes containing a high content of fillers it is advisable to add water in small quantities during the mixing process to keep the consistency of the mass as uniform as possible. The addition of water can be made automatically. In this way most mineral fillers as well as blacks can be incorporated. The addition of magnesia and lime should be avoided during the mixing process as these substances generally have a strong coagulating effect on latex.

The addition of American gas black easily takes place up to 25 per cent on the rubber during the mixing process provided sufficient water is added. If the content of gas black exceeds this figure it is advisable to add the excess during the subsequent drying process. Oils or melted wax softeners can be added in the mixing machine. The addition of reclaim, if not in the form of a water dispersion, substitutes, mineral rubber, etc., is recommended only during mastication.

The mixing process requires but little power, owing to the soft consistency of the material. Its speed depends on the size of the apparatus and the quantity of fillers added. For example, 50 kg. of mix corresponding to 40 kg. solid content with 20 per cent of fillers can be produced in 5 minutes in a machine of 60 kg. capacity requiring a maximum of 2 h. p.

The finished mix is tilted from the machine into the ordinary rubber warming mill, one roll of which is corrugated spirally. About 30 pounds of steam is used to warm the rolls. The latter are set together closely to form a thin coating on both rollers to hasten evaporation. The rubber mixing is finally sheeted several times to remove the last traces of moisture and is completed on a warm smooth mill. The drying time depends on the size of mill and batch. The drying can be hastened by a ventilator above the rolls.

Carbon black in excess of 20 per cent can be added while the paste-like material is well distributed over the rolls. The large particle surface of carbon black as well as its strong absorptive property tends to reduce the drying time of mixings. It is possible without difficulty to mix by this method 200 per cent of carbon black on the rubber.

Vulcanization

Mixings with Revertex cure much more rapidly than those containing smoked sheet or crepe because of the presence of natural accelerators, the activity of which remains unchanged due to the low temperatures used and omission of strong chemical reagents in the basic process. In a pure gum stock the addition of about one per cent of D. P. G. is required to equal the effect of the natural accelerators present. It is therefore advisable to dry and mill Revertex mixings carefully to avoid scorching. The addition of accelerators and sulphur should be made at the very last moment on the rolls. This refers particularly to the tire compounds.

Comparison With Smoked Sheet

The superiority of the tensile properties of Revertex over smoked sheets is shown in Table I.

TABLE I

Mix	Revertex	Smoked Sheet
....	100 Rubber	100 Rubber
....	5 Zn O	5 Zn O
....	3.5 S	3.5 S
....	0.5 Stearic acid	0.5 Stearic acid
....		0.5 D. P. G.

Vulcanization Min. at 45 Lbs.	Load at Break, kg./cm²	Elongat. at Break, Per Cent	Load at Break, kg./cm²	Elongat. at Break, Per Cent
15	159	897	55	962
30	204	845	111	808
40	180	825	118	813
50	166	803	127	791
60	147	772	139	769
80	168	821	143	768
120	154	861	135	759

Similarly the other physical properties, permanent set, tearing effect, aging and abrasion have been investigated and each was found superior. Revertex can naturally be utilized in making cements and solutions. This refers especially to the manufacture of weftless cords and eliminates solvent recovery in the process. A far stronger film of rubber can be applied in a simple coat and the watery dispersion penetrates the fabric better than a benzine rubber solution.

Rubber Compared to Steel[1]

The Extensibility, Strength and Energy Absorbing Ability of Rubber Make It an Important Material for Mechanical Engineering

THE purpose of this paper is to call to the attention of automotive engineers some of the fundamental mechanical properties of rubber, in comparison with those of steel. Many of these properties have been used, often unconsciously, by engineers who were employing rubber chiefly on account of some other characteristic. Rubber is waterproof, a good insulator, quite resistant to the weather and to chemicals, and can readily be molded and otherwise fabricated. In many cases, however, none of these properties would be particularly useful if rubber did not in addition possess the mechanical properties which make it unique, which permit hose and insulated wires to be bent, tires to be flexed repeatedly, and inner tubes to be inflated. It is these fundamental elastic properties which we are going to discuss briefly, with the hope that by a better understanding of them engineers may more and more consider rubber as a material to be used on account of these primary mechanical properties. Let us hope that rubber will shortly take its place among recognized structural materials in engineering handbooks, so that data on the mechanical properties of rubber will be readily available.

Rubber is unlike any other engineering material in several respects. In the first place, its properties may be made to vary over a much wider range than any other material. Compounds can be made having qualities varying from the tough, horny consistency of hard rubber to a soft, more or less yielding product. It is, however, the intermediate type of material which interests us at this time, the type of rubber familiar to us all in the form of inner tubes, elastic bands, and tires. Even in this group there is a wide range of properties, and it is particularly to these properties and their utilization that I wish to call your attention.

To the engineer, one of the most remarkable characteristics of rubber is its ability to permit an enormous change of shape when a load is applied, and to resume its original shape when the stress is removed. A piece of well vulcanized high grade rubber compound can be stretched to ten or eleven times its length without rupture or appreciable permanent deformation. Another property, in some respects fully as remarkable, is the high strength possessed by rubber. A piece of rubber like that referred to above may have a tensile strength, figured on the original cross-section, of 5,000 pounds per square inch. The actual strength of such a sample at its breaking point is, however, about 50,000 pounds per square inch, calculated on its cross-section at break, thus approaching the strength of steel.

From these two considerations of stretch and strength, we pass logically to the third interesting property, namely, the ability of rubber to absorb energy. While of course many materials surpass rubber in strength, none approach it as a medium for the adsorption of energy. The stress-strain curve of rubber is not a straight line, but we will probably not be far off if for the time being we assume it to be straight.

Let us consider a piece of rubber having a cross-section of 1 inch square, and a working length of 1 inch. Such a piece of rubber may be stretched to a total length of 11 inches. If the load at this elongation is, say, 4,000 pounds, and we assume a straight line stress-strain curve, the rubber will have absorbed 1,600 foot pounds of energy. Such a piece of rubber will weigh about .04 pounds. Those having a liking for mathematics may figure easily from this that 1 pound of rubber similarly treated will absorb 40,000 foot pounds. If such an elongation occurs in cycles of one minute, our piece of rubber, weighing 1 pound, and occupying about 25 cubic inches, is absorbing energy equivalent to the entire output of a 1¼ horse power motor. A steel spring capable of doing this would weigh 50 to 100 pounds, depending on the type of steel.

Rubber of course would not ordinarily be used with such a small factor of safety. As a result, however, of having such enormous ability to suffer distortion and to absorb energy, smaller distortions and loads may be repeatedly applied and removed without appreciably deteriorating the material. The tire is probably the best example of this, but in practically all rubber goods this

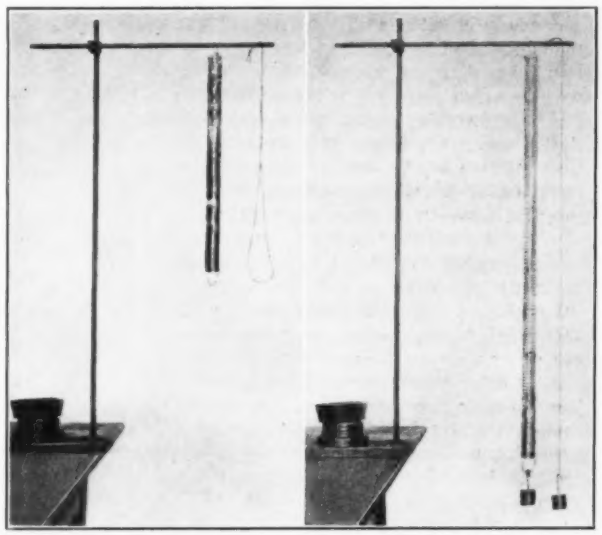


FIG. 1. UNLOADED FIG. 2. LOADED

Steel Spring and Rubber Band Having Approximately the Same Elastic Properties

property is utilized; for example, motor mountings, shackles, radiator hose, molded parts or strips, and many other articles utilize this property.

Having considered how much we can distort rubber, and how much mechanical energy it can be made to absorb, let us now consider what happens to this energy. If we stretch a piece of steel, say in the form of a spring for convenience, and plot the strain against the stress, we obtain a straight line, which is the graphic representation of Hooke's law. The area under this curve, in proper units, represents the number of foot pounds of energy absorbed. If we release the spring and read the elongations and loads we retrace the first curve, and since the areas are equal, we say the energy absorbed is zero. We say that such a piece of steel is perfectly resilient. If, however, we study in detail the stress-strain curve of rubber, we find a quite different state of affairs. We find in the first place that the curve is not a straight line. It has three main sections. The first is one which might be called that of initial stiffness, when a large increase of load is required to extend the sample. The next is a practically straight portion, where, if we knew nothing of the previous or future life of the sample, we would say it was obeying Hooke's law. Just about the time one would expect to reach an elastic limit, and find on further stretching a greater elongation per increment of load, the sample suddenly stiffens and shows instead less extensibility per increment of load. This is one of the most remarkable properties of rubber; I know of no other material which acts in this way.

If we now gradually remove the load, and read the elongations, we find that the curve for retraction is not identical with that of

[1]By W. A. Gibbons, Ph.D., General Laboratories, United States Rubber Co., New York, N. Y.

extension, but that the loads at the same stretch are lower. The difference in the areas under the curves, that is, the area of loop between them, is the hysteresis loss, and is irreversible energy. It is this property of practically perfect restitution of form, with imperfect restitution of energy, which makes rubber valuable as a shock absorbing material. Here again we have a property possessed by no other material to the same degree. This can easily be demonstrated by applying the same elongations to a rubber band and to a steel spring of about the same characteristics, and then releasing both; the steel spring continues oscillating for a long time, while the rubber quickly comes to rest.

The resiliency of many materials may be modified by special treatments, such as tempering, but the useful range is quite limited. Rubber, however, may be modified greatly both by the vulcanizing process and by the admixture of other materials. For example, we have here five different compounds varying from a pure gum stock to two quite highly compounded. Figure 3 shows the stress-strain curves of these compounds. You will see that they differ enormously in stiffness. If we take the load necessary to double the length as an index, it runs from 30 pounds in the softest stock to 1,200 pounds in the stiffest, yet all five stocks are in practical use for various purposes. Likewise, Figure 4 shows the hysteresis loops for these five stocks; the great differences in total absorption of energy are very evident.

In order to secure both the same total and irreversible energy absorption with any other material or materials, we would have to resort to a structure or machine. If we put a dash-pot on the steel spring, we approach the properties of the rubber. In the rubber we have a combined spring and shock absorber. Rubber replaces a machine or structure.

I would like now to call your attention to some of the possible applications of these properties. The relatively large distortion of rubber for a given load is obvious. This low elastic modulus combined with a high hysteresis produces some interesting effects. Turning again to our steel spring, we see that a slight vibration is carried faithfully through the entire length of the spring, and with proper mountings it could be demonstrated that this might be reflected back and forth for a long period, so perfect is the restitution of energy in the case of steel. If our steel is not

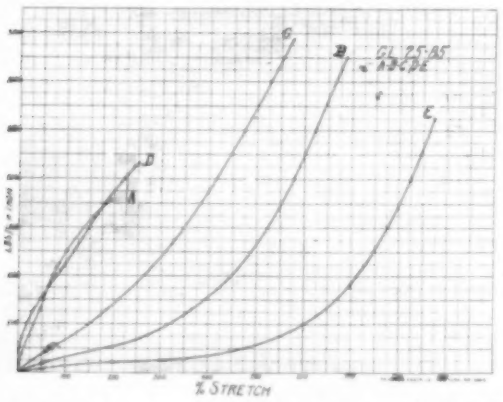


Fig. 3. Stress-Strain Curves of Rubber Compounds of Different Degrees of Stiffness

arranged in the form of a spring, a small shock will be carried of course with extreme rapidity, owing to the high elastic modulus of the medal. With rubber, on the other hand, the elastic modulus is low; small shocks produce vibrations of lower frequency and the high hysteresis makes them readily absorbed.

Of course the same piece of rubber can function simultaneously in both ways—it can absorb large displacements and at the same time obliterate most if not all small vibrations. A rubber tire does both. The steel springs in a car absorb the large shocks and this is made to some extent irreversible by the friction of the leaves and by the addition of shock absorbers. They do not, however, absorb the small high frequency vibrations. Rubber will do both.

We shall conclude with a brief discussion of some of the mechanical uses of rubber in the automotive industry. In an automobile, rubber can be used to absorb shocks and particularly vibrations between spring and chassis, motor and chassis, and between propeller shaft and chassis. In a supplementary way it

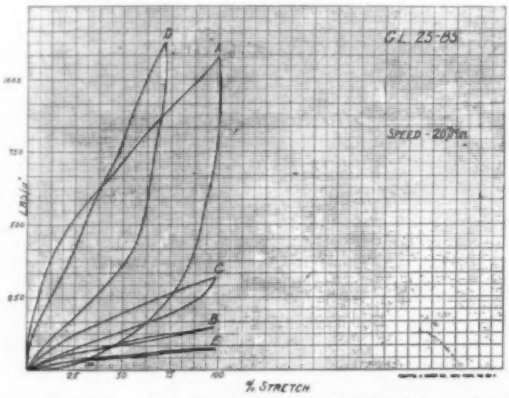


Fig. 4. Hysteresis Curves of Rubber Compounds of Different Degrees of Stiffness

can be used to give a vibrationless connection between body and chassis, between parts of equipment such as the gasoline tank, steering mechanism, etc. Rubber is particularly valuable in these locations, since it breaks up vibrations and prevents them from being carried from one metal part to the other. By separating those members, where vibrations may originate, from the rest of the car by means of rubber, we localize the vibrations, thus stopping the trouble at the source.

In this short discussion no attempt has been made to go into the principles of rubber compounds and the effect of compounding on the properties of the material. However, much work has been done on this important subject, and relating to the testing, physical properties, and compounding of rubber.

A STEAM ACCUMULATOR

It has been understood for many years that the deadliness of fire tube boiler explosions is due to the large volume of hot water stored in them. The volume is much greater than the amount of water stored in water tube boilers. Fire tube boiler explosions are generally far more violent than water tube boiler explosions.

In other words water is capable of storing heat and steam. Thus large tanks can be constructed to hold considerable water and they can be arranged to store valuable steam that would otherwise be wasted. Then when there is a special demand for surplus steam the steam stored in this water flashes back into steam and we have an important saving.

In plants where considerable process steam is required and the demand for the steam is irregular, when a valve is suddenly opened there is a considerable usage of steam for several minutes while the liquor is being heated. By the installation of an accumulator it may be possible to save the cost of an additional boiler to provide sufficient capacity to take care of peak loads.

For example, if the temperature of the water is 250 degrees, 4 per cent will flash into steam; if 300 degrees, 9 per cent will flash into steam and if 500 degrees, 31.3 per cent will flash into steam. Thus the higher the temperature of the water the greater its flash value and the higher the temperature of any gases now being wasted the greater the reason why their heat should be stored.—W. F. Schaphorst, M. E.

EXPORTS TO CANADA OF AMERICAN-MADE RUBBER BELTING HAVE for the past three years been estimated as follows: 1924, 293,741 pounds; 1925, 372,703; 1926, 359,533 pounds.

Tetraline Solvent Recovery Process

Physical Properties of Tetraline — The Bregeat Solvent Recovery Apparatus — Successful European Installations

THE manufacture of certain rubber goods involves the preparation of a solution of rubber in a volatile liquid solvent, such as benzol and gasoline. This solution is only an intermediate product, from which the volatile solvent is subsequently vaporized, leaving the rubber in the desired form of dry films, sheets, coats, etc. This vaporization is generally conducted with the assistance of air and heat and, therefore, results in the formation of a hot gaseous mixture containing all the solvent as vapor mixed with air. The object of solvent recovery is to bring back this vapor to the liquid state, suitable for re-use in the manufacturing process and, above all, to do it profitably.

Solvent recovery involves gathering the solvent vapor, and recovering the solvent from the gaseous mixtures. For the latter operation there are three types of process, namely: by condensation; by absorption in solid absorbents; and absorption in liquid absorbents. Each type of process has its special adaptations. In the one here described a special liquid absorbent, tetraline, is used.

Physical Properties of Tetraline

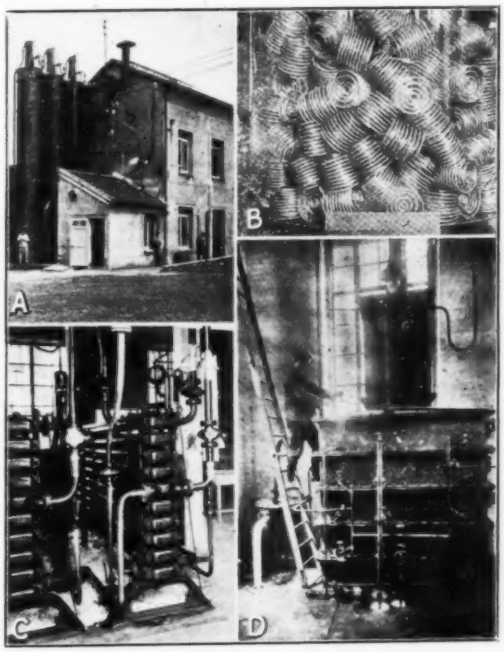
It has been found recently that the hydrogenated derivatives of naphthalene possess a certain degrees of chemical affinity for hydrocarbon vapors and more particularly for benzol and gasoline vapors, without being opened to the objections affecting other liquid absorbents[1]. Among these compounds is tetrahydronaphthalene, commercially called Tetraline. This is a commercial product open to competition and not a specialty. It is made from naphthalene and hydrogen available in unlimited quantities. It is a desirable absorbent, on account of its moderate price and favorable physical properties as summarized below.

Chemical composition, C_{10} H_{12}; Molecular weight, 132; Specific gravity at 60 degrees F., 0.978; Boiling point, 400 degrees F.; Solidifying point, 26 degrees F.; Viscosity and color, water white.

The affinity of Tetraline for gasoline and benzol vapors is such that a practically complete absorption and a high concentration of the solvent in the absorbent can easily be obtained under atmospheric pressure after only a comparatively short contact between gas and absorbent. Advantage can be taken of this affinity to dilute the vapor with a proportion of air sufficient to obtain a lean gaseous mixture well below the lower explosive limit, thereby eliminating all explosion and fire hazard and speeding up drying.

Tetraline absorbs no water vapor from the atmosphere treated and is easily stripped by distillation from its benzol or gasoline content. This indifference of tetraline to water vapor makes it possible to effectively cool the gaseous mixture by direct contact with a water spray. In the same manner the hot absorbent leaving the still can be properly cooled by direct contact with cold water.

Tetraline has the further advantage of being a definite chemical compound, remaining unaltered and retaining indefinitely its high absorbing power and low viscosity through unlimited periods of operation. It is not in the least affected by the air contained in the atmosphere treated. Thus it appears to be the ideal absorbent for recovering the solvents lost in the rubber industry, its advantages combined with those inherent to the liquid absorption system of solvent recovery result in a safe, efficient, automatic, dependable and economical operation. These facts are well established by a record of several years in various industries including the recovery of gasoline from natural gas, of benzol from coke oven gas, of light oils from the low temperature carbonization of coal, and more particularly in the recovery of benzine and gasoline lost in the manufacture of rubber products.



A—Absorption Towers. *B*—Tower Filling. *C*—Heat Exchanger. *D*—Preheater and Stripping Still

The Callou Installation

The first application of the tetraline absorption process in the rubber industry took place three years ago at the plant of Callou & Co., Clichy, near Paris, France. This concern specializes in the production of rubber cloth, using the ordinary roller and knife spreader to apply one or more coats of a thick solution of rubber in benzol or gasoline. The cloth then travels through a tunnel made of steel sheets and heated by steam coils.

The air containing the solvent vaporized in the tunnel is steadily drawn through a suitable flame arrestor, and by means of an electrically driven fan, into a main whence it is blown through the absorption tower of the recovery plant. There are six tunnels of this kind so arranged that the cloth can be inspected by raising movable panels. As the air is drawn from the tunnel instead of being blown, no vapor is likely to escape in the workroom, thus the sanitary conditions of the workmen, as well as safety from fire and explosion hazard, are correspondingly improved.

The solvent recovery plant receives practically all of the solvent vapor evolved in the tunnel and recovers from it over 95 per cent, corresponding to 20 gallons per hour when all coating machines are running full. The apparatus used in the recovery plant is of the type shown in the group illustration.

The Bregeat Apparatus

Absorption is obtained by circulating the liquid absorbent countercurrently to the gas stream whereby the solvent vapor is absorbed into the liquid and the air stripped from its solvent vapor is allowed to escape to the atmosphere. This operation is generally conducted in cylindrical towers, similar to those represented in the illustration *A*, and filled with a suitable packing, such as wooden grids or wire coils shown at *B*. The gaseous mixture is introduced continuously at the bottom of the tower and is repeatedly divided or split by the packing into a multitude of fine streams traveling upwards

[1]The process is patented in 21 industrial countries: United States Patent No. 1,513,153; French Patent No. 554,327; D. R. P. No. 387,583; British Patent No. 201,199.

through the tower. The liquid absorbent is continuously fed and distributed at the top of the tower over the packing and flows downwards over this packing, in intimate contact with the ascending gas, with the result that a stream of liquid absorbent enriched with the solvent is continuously discharged at the bottom of the tower, while the gas, generally air, stripped from the solvent vapor escapes at the top. Several towers may be used either in series or in parallel, as local conditions demand.

The liquid absorbent enriched in the above operation with the solvent extracted from the gaseous mixture is continuously pumped, through a suitable heat exchanger and preheater, illustration *C*, to a still, illustration *D*, where the solvent is distilled out of the liquid.

The liquid leaves the still stripped from its solvent content and after proper cooling, through a heat exchanger and a cooler, is pumped back to the top of the absorption towers, thereby closing the cycle of operations.

The solvent vapor evolved from the liquid circulating through the still is condensed and returned in liquid form to be re-used in the manufacturing process.

According to the above description, the liquid absorbent circulates continuously in a closed circuit from the absorption towers, where it absorbs the solvent vapors, to the stripping still, where the solvent vapors are given off, and back to the absorption towers. The operation closely follows that obtained in absorption plants for recovering benzol from coal gas and gasoline from natural gas. Therefore, whenever the solvents to be recovered belong to the benzol and gasoline class, as is generally the case in the rubber industry, it is quite natural to apply the same processes and absorbents as those successfully used in the benzol and gasoline industries.

The presence of a large proportion of air in the gaseous mixtures obtained in the rubber industry involves a serious difficulty. Under these circumstances and in spite of its inherent advantages, the oil absorption process could not be profitably applied to the recovery of solvents lost in the rubber industry, were it not for the discovery of tetraline as a liquid absorbent eliminating all of the difficulties encountered.

In the tetraline process the plant does not require continuous attention and the operator in charge has generally some spare time for other work. The steam consumption is very low and may vary from two to four pounds per pound of solvent recovered, according to local circumstances and design of equipment. The air stripped from benzol vapor and discharged from the absorption tower contains only a small amount of tetraline vapor which can easily be recovered at low cost and with very little equipment. At the Callou plant the amount is so small that this recovery is not done, but in larger plants it would be justified.

Convinced by the success of this system of solvent recovery at the Callou plant, several larger installations are under erection in Germany and Russia.

Economic production of rubber articles, protection of the health of workmen and safety from fire hazard command the general adoption of practical and efficient solvent recovery processes by the rubber industry.

The discharge of enormous quantities of valuable solvent vapors into the atmosphere is not only wasteful but dangerous practice. Under the growing stress of competition, rubber manufacturers will feel more and more the necessity of eliminating waste as far as possible. Absorption in suitable liquids, as in tetraline, affords an economical, dependable and safe system applicable to all cases, including the recovery of solvent from lean gases.

BRITISH EXPORTS DURING THE YEAR 1926 OF AUTOMOBILE TIRES numbered 904,448, value £2,694,818, a decided advance over the 1925 figures of 872,385 casings, value £2,275,374. The leading markets in 1926 were: British India, taking 108,032 casings, value £291,641; Australia, 74,468, value £292,882; and New Zealand, 72,788, value £258,962. Other good customers were the Irish Free State, British South Africa, and Denmark and the Faroe Islands.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

NUMBER	INQUIRY
923	Manufacturers of office supplies and stationers' sundries.
924	Factories to make rubber balls from special molds.
925	Apparatus for lacing belts.
926	Manufacturers of window cleaning squegee.
927	Dealers in hollands.
928	Makers of time period alarm clocks.
929	Source of supply for Quinodine.

Foreign Trade Information

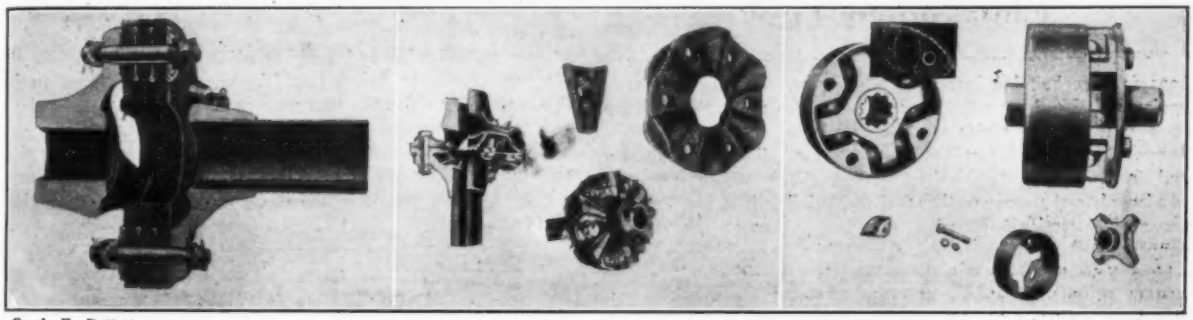
For further information concerning the inquiries listed below, address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

NUMBER	COUNTRY AND COMMODITY	PURCHASE OR AGENCY
23,708	Mexico. Rubber sole manufacturing machinery.	Purchase
23,741	Chile. Garters and elastic supporters.	Purchase and agency
23,755	Netherlands. Rubber surgical articles.	Sole agency
23,759	Denmark. Rubber sponge pillows, for hospital use.	Agency
23,784	Bulgaria. Rubberized sanitary articles.	Agency
23,825	Germany. Sport shoes with rubber soles and canvas tops.	Purchase and agency
23,826	Denmark. Heels and soles.	Purchase
23,827	Ireland. Automobile tires.	Agency
23,833	Germany. Automobile tires.	Agency
23,859	Germany. Elastic belts for men.	Purchase and agency
23,901	Argentina. Automobile tires.	Agency
23,903	Egypt. Automobile tires.	Agency
23,942	Porto Rico. Rubber heels.	Purchase
23,943	Honduras. Solid and pneumatic tires.	Purchase
23,944	Germany. Automobile and motorcycle tires, and solid tires for trucks.	Purchase or agency
23,945	Brazil. Bathing shoes, all rubber, in colors.	Purchase or agency
23,946	France. Solid and pneumatic tires.	Agency
24,001	Germany. Manifold doubling machines for balata belting industry.	Purchase
24,049	Iraq. Rubber boots and shoes and canvas rubber-soled shoes.	Purchase and agency
24,051	Australia. Golf balls.	Purchase and agency
24,067	Haiti. Canvas rubber-soled shoes.	Agency

Foreign Trade Circulars

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C. The publications which give details of the rubber industry in some one country are marked with an asterisk.

NUMBER	SPECIAL CIRCULAR
1382	"Tire Exporters' Weekly News Letter."
1384	"Mechanical Rubber Goods Exporters' Monthly News Letter."
1385	"Tire Exporters' Weekly News Letter."
1386	"Crude Rubber News Letter."
*1390	"December Imports of Rubber Tires Into the United States."
*1392	"Canadian Tire Exports During December, 1926."
*1393	"British Exports of Automobile Casings During November, 1926."
*1395	"Canadian Tire Exports During the Calendar Year 1926."
*1396	"Canadian Exports of Rubber Footwear During the Calendar Year 1926."
1397	"Tire Exporters' Weekly News Letter."
*1399	"Comparative Statement Showing Number of Automobile Casings Shipped from United States to Foreign Countries During 1924, 1925 and 1926."
*1401	"Comparative Statement Showing Number of Pounds of Rubber Belting Shipped from United States to Foreign Countries During 1924, 1925 and 1926."
*1403	"Hamburg Rubber Tire Market."
1406	"Rubber Footwear Exporters' Monthly News Letter."
1407	"Tire Exporters' Weekly News Letter."
1408	"Comparative Tire Exports from United States, Canada, United Kingdom, France, Italy, and Germany During First Nine Months of 1926."
*1409	Comparative Statement Showing Number of Pairs of Rubber Boots Shipped from United States to Foreign Countries During 1924, 1925 and 1926."
*1412	"British Exports of Automobile Casings During December and the Calendar Year 1926."
1413	"Crude Rubber News Letter."
*1414	"Rubber Footwear Exports from United Kingdom During December and the Calendar Year 1926."
*1415	"French Tire Exports During the Calendar Year 1926."
*1416	"French Rubber Footwear Exports During Calendar Year 1926."



S. A. E. Bulletin

Snead Fabric Disk Joint | Spicer-Goodrich Disk | Spicer Cushion Ball Joint

Rubber in Universal Joints

Non-Lubricating, Yet Affording More Wear, Flexibility, and Uniform Rotational Velocity—Ball and Fabric Types

One of the newer uses of rubber in mechanics is that of cushioning the bearings and enhancing the efficiency of universal joints. The universal joint, a device so essential for transmitting power mechanically through an angle in gasoline driven vehicles, was known in England as early as the thirteenth century. Later an Italian, Cardano (1501-1576), developed what has come to be known on the Continent as the Cardan joint and quite like the universal joint for which in 1664, Robert Hooke obtained a patent in England. It embodies the chief features of the modern device, and in English textbooks is referred to as Hooke's coupling. While, with simple modifications, it served mechanical needs for nearly two and a half centuries, the more recent, diverse, and considerable applications of power have made its improvement urgent; and upon the designing of more efficient joints much inventive genius has been expended.

In its simplest form, as in the Hooke type, the universal joint consists of a four-arm cross with two of its ends pivoted to the forked ends of one shaft, while the other two ends of the cross are pivoted to the forked ends of another shaft, the yoke or fork axes always intersecting. When the driving and the driven shafts form equal angles with the intermediate shaft, and the axes of the joint yokes on the intermediate lie in the same plane, and the device is used at a moderate angle, as in most motor cars, the universal joint is very effective.

Absorbing Shocks—Dispensing with Lubricants

Universal joints are ordinarily oil or grease-lubricated; but engineers have long aimed to design a joint which will not need lubrication and yet which, through minimized wear and strain, will last as long as the vehicle in which it may be used. A close approximation to such a desideratum is said to be the Spicer cushion ball universal joint. In it a splined cross, carried on either the driving or the driven member, has recessions in its arms to receive rubber balls. On a companion flange on the other driving or driven member are bolted four triangular-shaped metal blocks set within thin sheet metal housing. In the triangular pieces are also recesses to receive rubber balls. When assembled the joint has eight rubber balls held in the opposed recesses, and while four carry the load in one direction, four carry it in the other. No lubricant is used.

When such a joint is operated at an angle the rolling of the rubber balls is sufficient to afford a free universal movement. Such a coupling is said to be very efficient, not only in all classes of normally straight line service, but also in propeller shaft applications where the angle is not great. In gasoline-electric generator service such a cushion-ball coupling is said to be especially valuable, the rubber absorbing the variations in the speed of the crankshaft between explosions and permitting the dynamo armature, acting as a flywheel, to revolve at practically constant speed. All moving parts are said to be relieved of the serious strains to which they would be subjected were solid or all-metal couplings used, and quietness and flexibility are imparted to the entire assembly.

A modified type has two 2-arm yokes instead of the 4-arm cross, affording a short, well-cushioned coupling giving good alinement.

Fabric and Rubber Joint Disks

Many attempts have been made to improve upon the universal joint through utilizing various kinds of rubber and fabric disks. One recent effort to make a fabric power-transmitting element more durable was shown in the Sims coupling, which met with much favor in England. In another fabric disk type, the Climax joint, the torque is transmitted through the direct pull of cords, as in cord tire construction; and much rubber is put around the bolt holes to distribute bolt pressure.

In another rubber-fabric universal joint, the Merchant & Evans, the disk has permanent grooves into which are fitted washers. The clamping pressure along the edge of each washer is much reduced by the large surface contact with the disk, it does not bite into the latter, bending stress is relieved by working of the fabric under the edge, and bolts stay tighter much longer.

Staggered Weaves—Rubber Cores—Higher Mileage

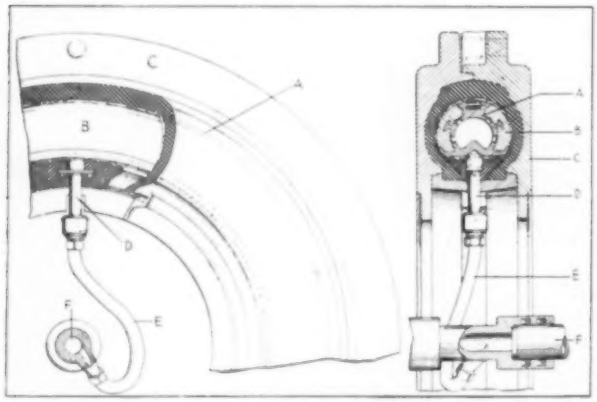
To provide a universal joint that would require practically no lubrication, leather disks were tried about 1907, and later disks cut from rubber belting, but without much success. Then Edward J. Hardy, of England, produced a staggered weave fabric to better distribute the load throughout the disk, and through the Thermoid Rubber Co. such disks have been widely distributed. The B. F. Goodrich Rubber Co. next produced the composition fabric and rubber disks used in the Snead joint. The disks are held by spider washers, and studs mounted in taper holes to maintain stud alinement, and also edged with fillets to prevent disk cutting.

The Snead propeller-shaft rights have since passed to the Spicer company, as well as the marketing rights to a new type of disk (the Spicer-Goodrich Long Life) lately developed by The B. F. Goodrich Co. In this disk the fabric can buckle readily without injury to itself. An initial wave is put into the fabric and the interior space is then filled with a large core of live rubber, making the coupling much more flexible than one made with two or three plain disks, supporting the flexible members, considerably increasing the cushioning effect, and substantially carrying the driving stress. Such disk drives, without any care, are said to show commonly over 50,000 miles of service.

Clay Blown Tires

The construction, maintenance and replacement of air or water bags for tire building involve heavy expense for very perishable equipment. Until recently, however, no better method of inflating tires in the curing molds has been available. Now, however, a process has been invented which possesses distinct advantages and economy over the air bag method. While the new process is adapted to the usual methods of tire building it is preferable to use a rigid sectional, absorbent tire building core. The accompanying illustration represents sections of this core. It is hollow with a light inner metal body *A*, and is covered with a porous coating *B*, such as plaster of paris. Excessive porosity of this absorbent covering is prevented by mixing tiling cement with the plaster.

When built upon this core, and after placing the bead rings in position, the tire is put into the ordinary mold *C*, and loaded into the vulcanizer. A nozzle *D*, is connected by flexible tubing *E*, to the



Gammeter Clay Blown Tire Core

hollow shaft *F*, through which a pasty clay mixing from a source of supply is forced directly between the inner ply of the tire casing and the core, imparting the requisite force to stretch and support the tire against the mold thus functioning in the same manner as an air bag.

The most satisfactory distending plastic is Atlas ball clay such as is used in the ceramic industry. This requires only a small amount of water to render it fluid and yet it sets promptly under pressure when a certain content of water glass is added and thoroughly dispersed in the mixture. Any type of vulcanizer may be used and the plastic clay may be conducted to the tires even from a distant source of supply if maintained under constant pressure.

As the plastic clay is forced into the tire, compressing and molding the beads, it flows upward around the sides of the core, distending the tire in the warm mold. The latter has already softened the outer surface of the tire so that it expands freely and the tread conforms to the mold. At this point the steam is turned into the vulcanizer to effect the cure.

The inner plies are not penetrated by the plastic material or fluid while it is distending and shaping the rubber exterior of the tire against the mold because the inner parts of the tire are relatively cool until expansion and molding have taken place. When the stretched tire is stopped by the locked mold a high pressure is attained in the plastic material, with the result that the moisture is expelled from the liquid clay passing into the porous covering *B*, of the core as well as being absorbed by capillary action. The clay is stiffened by this loss of moisture and serves as a support for holding the distended tire against the mold, thus preventing traction of the inner plies. The pressure, porosity of the core, and heating of the tire, can be so correlated as to fully distend and mold the tire before the plastic clay becomes too stiff for proper flow and before the inner plies become excessively softened.

After vulcanization and removal of the core the solidified dry clay can readily be flaked from the core and the inner surface of the tire. Any damage that may occur to the absorbent plaster base is easily repaired.

This process, offering great possibilities of economy in rubber and equipment for the tire manufacturing industry, is the invention of John R. Gammeter, well known rubber process engineer of Akron, Ohio.

Legal Decisions

Ex Parte Charles Edgar Maynard: Decision, Commissioner of Patents.

Patent No. 1,615,992 was issued to C. E. Maynard February 1, 1927, for inner tube manufacture, on application No. 636,855, filed May 5, 1923. The rejection of claims 1, 3 and 5 of the application was affirmed as to claim 1 and reversed as to claims 3 and 5. The decision was rendered by First Assistant Commissioner W. A. Kinnan, December 6, 1926.

Patent Suits

Ex Parte the Norwalk Tire & Rubber Co.; Decision, Assistant Commissioner of Patents.

Peculiar or special markings constituting the tread of a rubber tire are not registrable as a trade mark, First Assistant Commissioner W. A. Kinnan held in this appeal upon application No. 221,448, filed October 8, 1925.

The holding of the court in the case of In re The Goodyear Tire & Rubber Co., 339 O. G. 764, 55 App. D. C. 400, has been relied upon as determinative of the case at bar. The decision of the examiner of trade marks is affirmed, January 31, 1927.

Adjudicated Patents

No. 1,244,245, W. H. Robertson, tire-inspecting machine, suit filed Dec. 22, 1926, D. C., E. D. Wis. (Milwaukee), Doc. 1991 C. D., W. H. Robertson v. Western Motor & Supply Co. et. al.—*Official Gazette*, Volume 355, p. 189.

No. 1,595,051, M. S. George, baby pants; Des. 59,736, same, garment protector, suit filed Nov. 29, 1926, D. C., N. D. Ill. (E. Div.), Doc. 6623, M. S. George v. Sanitary Rubber Novelty & Manufacturing Co.—*Official Gazette*, Volume, 355, p. 190.

GRASSELLI APPEALS ACCELERATOR SUIT

The Grasselli Chemical Co., 347 Madison avenue, New York, N. Y., will appeal from the decision of Judge Augustus N. Hand in the United States District Court in New York, in the suit brought by The Grasselli Chemical Co., against National Aniline & Chemical Co., Inc., for infringement of United States patent No. 1,149,580 relating to the acceleration of vulcanization. This appeal will take the case to the United States Circuit Court of Appeals for the Second Circuit in New York.

The two claims under litigation were in respect to diphenyl guanidine and triphenyl guanidine. The Hofmann and Gottlob patent No. 1,149,580 contains six claims, of which only the above two were involved in the case decided by Judge Hand. His opinion makes it clear that the validity of the other claims covering the use of hexamethylenetetramine, aldehyde ammonia and similar materials is not affected in any way.

DURING 1926 CANADA IMPORTED, ACCORDING TO REPORTS BY THE Dominion Bureau of Statistics, 20,253 long tons of crude rubber, value $24,963,954, or an average price of 55.03 cents a pound. These imports for the first half of the year had a total value of $15,104,874, an average of 66.12 cents a pound, as against $9,859,080 for the second half, or 43.78 cents a pound.

Automotive Rubber Goods Exports

Phillip M. Crawford[1]

UNITED STATES exports of rubber manufactures have had a consistent upward value trend during the past three years. The 1926 exports of $60,051,332 exceeded the 1925 exports of $52,629,922 by 14 per cent; the value of 1925 shipments also exceeded the 1924 exports by almost 30 per cent.

Furthermore, the first three most important classes, automotive, footwear, and mechanicals, gained in relative importance at the expense of other classes of rubber goods. Table 1 presents the position of the four classes of rubber goods during the past three years:

TABLE 1
PERCENTAGE OF RUBBER GOODS EXPORTS

	1924		1925		1926	
Class	Value	Per Cent	Value	Per Cent	Value	Per Cent
Automotive rubber	$20,822,186	51.2	$29,002,167	55.1	$33,173,896	55.2
Footwear	6,752,211	16.6	7,426,403	14.1	9,155,606	15.3
Mechanicals	4,656,221	11.5	5,403,318	10.3	6,629,283	11.0
Other rubber manufactures	8,390,977	20.7	10,798,034	20.5	11,092,547	18.5
Total	$40,621,595	100.0	$52,629,922	100.0	$60,051,332	100.0

From this table the preponderant importance of the tire class is evident—more than half of the total value of rubber exports during each of the past three years consists of exports of this class.

Tires and Tubes

The increase registered in the tire class for 1926 was solely a value gain, as volume declined; consequently, it was attended by a decided increase in unit values. In 1925 the same condition was not true, as the increase in that year's shipments, compared with 1924, showed both a volume and a value gain, and the change in unit values was of little importance. Therefore, for comparative purposes the 1925 figures alone are used in Table 2.

TABLE 2
TIRE EXPORTS

	1925			1926		
Type	Quantity	Value	Unit Value	Quantity	Value	Unit Value
Automobile casings, number	1,628,219	$21,055,712	$12.93	1,497,132	$24,358,907	$16.27
Automobile inner tubes ....number	1,475,459	2,974,853	2.02	1,127,175	3,024,177	2.68
Solid tires for automobiles, .number	112,592	3,179,597	28.24	98,122	3,457,505	35.24
Other casings and tubes ...number	95,589	258,321	.....	70,806	218,769	.....
Other solid tires, pounds	1,714,813	429,948	.....	1,551,006	502,464	.....
Tire repair materials	.....	1,103,736	.....	.....	1,612,074	.....
Total	.....	$29,002,167	.....	.....	$33,173,896	.....

Unit Values

The unit value trend for automobile casings in 1925 and 1926 is interesting. During the first six months of 1925 the unit value for automobile casing exports was less than $12. This was a continuance of the declining trend evidenced in the latter part of 1924. However, beginning with the July, 1925, figure of $11.98, there was a rising unit value trend culminating in May, 1926, when the peak of $20.14 was reached. Since that time the trend has been downward with the lowest point reached thus far in November with $13.24. The December unit value was $13.40 per casing. However, it is doubtful if this $0.16 change marks a new upward trend.

Peak Shipments

The largest month's shipments of automobile casings in 1926 were in November—152,983 casings. December, which practically equaled this figure, and September, with 133,607, were the other two peaks of the second six-month period.

The largest month's shipments during the first six months were the April exports of 134,843 automobile casings. February shipments were also above 130,000, and March exports were slightly below that figure. The smallest exports of the year were the June shipments of 99,345 casings.

The average exports for the first six months were slightly over 122,000 casings per month and for the last six months more than 127,000. The yearly average was slightly less than 125,000 casings a month.

Volume Greater in 1925

In 1925 the average monthly shipment of automobile casings was slightly more than 135,000. The trend toward heavier shipments during the last six months of the year, which was observed in 1926, was also in evidence in 1925—exports for the first six months averaged slightly less than 133,000 a month, and for the last six months more than 137,000.

Peak shipments for the first six months were made in May, March, and April, with the second six-month period peaks in August and September. August exports of almost 168,000 casings were high for the year, and February with shipments of slightly over 105,000 was the low month.

The American continents furnish a market for more than 42 per cent of our total casing exports with fully half this total going to South America. The prominence of the Argentine and Brazilian markets are large factors in this high volume. Likewise Cuba and Mexico account for a large portion of the shipments to the Caribbean region. North America is not more prominent as an American market, because of the existence of large rubber-manufacturing industries operating in Canada behind stalwart protective-duty walls. On the American continents competition is very keen but with some few exceptions this competition is very largely between American and Canadian firms.

In the European market, however, the situation in relation to competition is decidedly different. Here American tires are forced to meet the competition of British and French makes in practically every market, and in many of the markets the competition is made more severe by the sale of domestic tires. European markets accounted for 33.9 per cent of the total exports by volume and 38.1 per cent by value. In all these markets the unit values are noticeably higher than the average unit value of all casing shipments in 1926. Southern Europe seems to be the weakest link of the European markets, and when the comparative importance of the markets in this section is considered it is evident that this condition is likely to exist for some time to come.

Asia, with Japan the lone market of major importance, took

TABLE 3
EXPORTS OF CASINGS BY CONTINENTS IN 1926

				Per Cent of Total by—	
Destination	Number	Value	Unit Value	Volume	Value
Total shipments	1,497,132	$24,358,907	$16.27	100.0	100.0
Europe (total)	506,922	$9,285,394	$18.32	33.9	38.1
Northern Europe	115,401	$2,006,640	$17.39	....	....
Central Europe	174,496	3,683,337	21.11	....	....
Southern Europe	62,234	1,053,663	16.93	....	....
British Isles	154,791	2,541,754	16.42	....	....
Americas (total)	634,471	$9,365,612	$14.76	42.4	38.5
North America	16,670	$282,270	$16.93	....	....
Caribbean region	238,532	3,273,763	13.72	....	....
South America	379,269	5,809,579	15.32	....	....
Asia (total)	257,885	$3,561,922	$13.81	17.2	14.6
Oceania (total)	62,660	1,527,612	24.38	4.2	6.3
Africa (total)	35,194	618,367	17.57	2.3	2.5

[1]Rubber Division, Department of Commerce, Washington, D. C. Reprinted from *Commerce Reports*.

over 17 per cent of our exports by volume and almost 15 per cent by value. Oceania was of more importance as a value market, taking 6.3 per cent of the total value but only 4.2 per cent of the total volume. Africa was of decidedly minor importance.

From Table 3 on the preceding page the relative importance of the various continents is apparent.

During 1926 Argentina was our most important customer. The United Kingdom, occupant of the first position in 1925, shifted to second position, with Cuba third, Germany, a newcomer, fourth, and Mexico, Japan, and Brazil following in the order named. These seven markets took over 52 per cent of our casing exports by volume and over 46 per cent by value. Table 4 shows the markets to which we exported more than 75,000 casings during 1926:

TABLE 4

EXPORTS OF CASINGS, BY COUNTRIES, TO PRINCIPAL MARKETS IN 1926

Destination	Number	Value	Unit Value	Per Cent of Total by— Volume	Value
Total shipments	1,497,132	$24,358,907	$16.27	100.0	100.0
Argentina	200,698	$2,817,639	$14.04	13.4	11.6
United Kingdom	151,980	2,515,790	16.55	10.1	10.3
Cuba	114,481	1,354,102	11.83	7.6	5.5
Germany	80,628	1,621,665	20.11	5.3	6.6
Mexico	80,122	1,078,649	13.46	5.3	4.4
Japan	79,123	881,750	11.14	5.2	3.6
Brazil	78,128	943,727	12.08	5.2	3.8

Inner Tubes Exports

It is noticeable that in 1926 the exportation of automobile inner tubes shows the customary situation, that of lagging considerably behind casing exports. In no single market of importance does the volume of exports of inner tubes equal the exports of automobile casings; in several markets the inner tube exports are very much lower than casing exports, the outstanding examples of this being the United Kingdom, Germany, Argentina, and Cuba.

The same value trend as was discussed at length for casings is also generally true for automobile inner tubes. Argentina, Cuba, and the United Kingdom each took more than 75,000 tubes in the course of 1926 trading. Exports of automobile inner tubes in 1926 totaled 1,127,175, valued at $3,024,177, as compared with exports of 1,475,459, valued at $2,974,853, in 1925. The unit values were $2.68 and $2.02, respectively.

Increased Solid Tire Unit Value

Solid tire exports followed the same general unit value trend as casings in 1926, the average value being $35.24, whereas the average was $28.24 in 1925. Record volume exports of 14,044 were made in March, and the general trend of exports of the first six months was better than that of the last six months when the low-volume shipment of less than 5,000 tires was made in August. However, since August there has been a staggered recovering trend. The principal markets for solid tires in 1926 were the United Kingdom, Argentina, Japan, Australia, and Cuba.

Tire Repair Materials

The value of exports of tire repair materials increased in 1926 to $1,612,074 from the 1925 value of $1,103,736. The principal markets for tire repair materials were Australia, Argentina, Canada, and the United Kingdom, each of these markets taking more than $100,000; Australia's purchases were valued at more than $200,000.

Decline in December Tire Exports

December exports of the tire group were valued at $2,699,794, a slight decline from the $2,775,381 shipments of November. In quantity, no single item of the December exports exceeded any of the November shipments, although all the important classifications except automobile inner tubes were comparable to the November figures. Unit values for automobile casings and solid tires for automobiles were higher, but the unit value of $2.27 for automobile tubes was the lowest for 1926, and marked a decided decline from the $2.58 unit value of November.

Table 5 presents the detailed position of tire group exports for November and December:

TABLE 5

TIRE EXPORTS

Item	November Quantity	November Value	November Unit Value	December Quantity	December Value	December Unit Value
Automobile casings, number	152,983	$2,025,175	$13.24	152,709	$2,045,727	$13.40
Automobile inner tubes, number	111,507	287,668	2.58	90,715	206,042	2.27
Solid tires for automobiles .....number	8,852	267,537	30.22	8,381	288,626	34.44
Other casings and tubes .....number	7,701	17,363	.....	2,794	8,345	.....
Other solid tires, pounds	146,339	36,430	.....	127,752	33,586	.....
Tire repair materials..	.....	141,208	.....	.....	117,468	.....
Total	.....	$2,775,381	.....	.....	$2,699,794	.....

The December automobile casing exports of 152,709 valued at $2,045,727, a unit value of $13.40, rank below only the November exports in volume and just above them in unit value. December exports were not so highly concentrated in a few large markets as were the November exports, when the casing shipments to five markets accounted for 52.7 per cent by volume and 48.8 per cent by value of the month's exports. In December only four markets were reported as recipients of more than 10,000 casings, and these took 39.2 per cent of the total exports by volume and 33.6 per cent by value.

The position of the chief markets were approximately the same: Argentina ranked first, the United Kingdom second, Brazil third, and Japan fourth, whereas shipments to Germany were not large enough to fall into the 10,000 class.

Inner Tube Markets

Japan, the largest buyer, took 10,693 automobile inner tubes valued at $14,696, and Argentina bought 10,548 valued at $17,584. The Philippine Islands, Spain, Brazil, Mexico, Germany, and Denmark were markets of secondary importance. In comparison with automobile casings the shipment of inner tubes during December was low.

Markets for Solid Tires

Exports of solid tires for automobiles to the United Kingdom totaled 1,682 valued at $53,619, to Japan 971 at $16,000, to Cuba 910 at $26,289, and to Argentina 701 at $20,548. These four countries took over 50 per cent by volume and over 40 per cent by value of the total solid tire exports.

Tire Repair Materials Below Average

The shipments of tire repair materials were less than the November exports of this class and considerably below the average of the first six months, but they almost equaled the average for the last six months.

MEASUREMENTS IN RUBBER INDUSTRY PLANTS

According to an investigation conducted by a prominent New York concern 50 per cent of the rubber industries in the United States makes careful measurements of the fuel used in their power plants; only 40 per cent measure the feed water; 89 per cent meter the current used, and 70 per cent meter their steam.

It generally pays to meter everything: fuel, water, electricity, and steam, so as to know just how much fuel is being used and what output is being obtained from that fuel. There is no better way in which to keep a constant check on over-all power plant efficiency and economy as well as on departmental efficiency and economy.

DURING 1926 BRITISH SOUTH AFRICA RANKED AS FOURTH AMONG nations importing American-made rubber belting, this one country taking the following amounts: 1924, 345,731 pounds; 1925, 248,758; and 1926, 355,157 pounds.

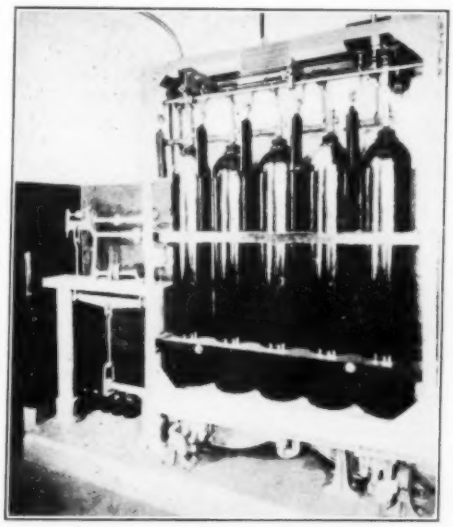
Effective Fire Prevention in Rubber Factories[1]

THE fire hazards found in rubber manufacturing plants are severe and should be given proper attention. Generally involving benzine, naphtha or gasoline fumes, a rubber plant conflagration comes without warning and much human suffering as well as great property damage is the result.

Inflammable solvents are constantly in use in practically all branches of the rubber industry. Particularly to be mentioned, are those processes involved in the manufacture of rubber cement, tires, tubes, footwear, proofing and spreader work, coated goods such as toy balloons, rubber gloves, and sundries. The grinding and use of dust in the hard rubber industry also presents an explosive hazard, and reclaiming plants are subject to fires originating from spontaneous combustion in scrap piles.

A review of rubber factory fires in the last few years reveals that most plants have cooperated to the fullest extent with the insurance companies and have organized plant fire brigades. Undoubtedly, a certain "esprit de corps" has been built up which has gone far toward eliminating unnecessary fire risks such as clandestine smoking within the plant, careless handling of inflammable materials, neglect of rubbish removal, and blocking up fire mains and exits. In the larger plants this work has been effectively organized under the safety engineer.

On the whole rubber manufacturing plants represent modern building construction and are well equipped with sprinkler systems, humidifiers, blower systems, and other mechanical means of improving general conditions as far as possible. However, it must not be overlooked that the type of conflagration encountered in the rubber industry makes exceedingly rapid and destructive headway. To cope successfully with this situation, the problem of adequate protection is resolved into extinguishing fire in its incipiency before it has a chance to spread and making reignition impossible.



The Lux Fire Prevention System

Adequate protection embodying the above mentioned principles is provided by a system that employs liquid carbon dioxide stored in steel cylinders as the extinguishing medium. This is a dry inert gas, odorless, colorless, non-corrosive and non-injurious to the finest materials. Upon discharge into the space on fire, the carbon dioxide instantaneously expands five hundred times its original stored liquid volume. This sudden and enormous ratio of expansion produces a refrigerating effect of extreme cold and makes possible the protection of a large space with a relatively small apparatus.

The principle of dry gas fire extinguishing is to have carbon dioxide issuing from every crack and crevice rather than having air enter. An incombustible gaseous blanket thus occupies the atmosphere surrounding the fire and suffocation results. Complete extinction of fires of any severity is accomplished within thirty seconds by this method.

A recent installation of a system in a prominent Pennsylvania linoleum company is representative of the type of installation for providing adequate fire protection and suggests the type applicable to cement mixing in rubber and varnish making in rubber footwear which are similar processes.

In the course of the manufacturing process, rosin and linseed oil are boiled in large kettles. Recently a fire occurred in one of these kettles which quickly assumed serious proportions. The carbon dioxide system demonstrated its efficiency by extinguishing the fire almost instantly without damage to either materials or equipment and operating schedules were delayed only long enough to make a thorough inspection.

The discharge of carbon dioxide to extinguish fire can be accomplished in either of four ways: (1) automatic fusible link or fixed temperature thermostat; (2) automatic rate of rise thermostat; (3) manual electric push button release; (4) manual pull handle. Methods 1 and 2 are recommended for the cement mixing department, spreader room, tube splicing department, and any place in the plant where rubber cement is being used in large quantities. For ordinary protection where there is no special hazard, manual release is perfectly satisfactory.

An illustration of protection as applied to "fast" fires is in the cleaning plant of a dye house where two naphtha rooms are protected. Each room is 20 by 32 by 10 feet, representing a volume of 6,400 cubic feet. The carbon dioxide source consists of a main charge of seven cylinders and an equal reserve supply. A supply pipe line leads from the cylinder battery to each space with branches for distribution. Outside, and near the exit to each room, is a break glass station containing a control handle for remote release of the system. Carbon dioxide is discharged simultaneously from all cylinders and fire is extinguished in its incipiency and before appreciable damage has been done.

The cylinders forming the central supply are all manifolded together and mounted on a scale equipped with an electric derangement alarm, making the system self supervisory. This reduces the maintenance cost.

Very rapid progress has been made the last few years in reducing fire risks in rubber factories. Almost every plant, for example, has a modern cement mixing unit located in a separate building some distance from the plant. Construction is usually steel framework reinforced and covered with light cement. All windows open outward; gears and motors are enclosed overhead; mechanical humidifiers which keep the air moist are standard equipment; spreaders are grounded; compound stock is delivered on frames instead of cloth wrappers to eliminate the danger of sparks when removing the slabs for insertion in the churns.

With the addition of a reliable system for "snuffing out" a fire almost before it starts, the above equipment represents the greatest possible insurance against fire or explosion in the rubber factory's most hazardous operation.

[1]T. J. Kauffeld, Engineer, Walter Kiddee & Co., Inc., New York, N. Y.

American Rubber Technologists

Research Chemists

THE rubber industry has long been guided in its development by the results of chemical and engineering research.

THE INDIA RUBBER WORLD *plans to record the names, academic attainments and scientific and technical accomplishments of American rubber technologists.*

The personnel will comprise research chemists, physicists, analysts, chemical, electrical, mechanical, process and production engineers, and technical superintendents.

HARLAN L. TRUMBULL, *b.* Adair, Ia. A.B. U. of Wash., 1907; M.A. 1908, Ph.D., U. of Chicago 1911; asst. prof. U. of Washington, 1911-1919; indus. fellow, Mellon Inst., 1917-1918; Capt. C. W. S. Edgewood Arsenal, 1918; expert War Trade Bd., 1919; research chem. The B. F. Goodrich Co., Akron, O., 1919; mgr. chem. research 1922-1927. *Author:* Physical Properties of Toxic Solutions; Molecular Weights of Gases by an Evaporation Method; Modified Method for the Analysis of Mixtures of Ethylene and Acetylene; Control Experiments in Chloropicrin Manufacture. Patents: Vulcanization accelerators, vulcanization method; crystal violet; alkalies from kelp, and dispersion of gum into a colloidal substance. *Member:* Am. Chem. Soc., Am. Inst. Chem. Engrs., A. A. A. S. Chemists Club, Gamma Alpha, Sigma Xi, Phi Lambda Upsilon. *Address:* Hudson, O.

Kenneth J. Soule, *b.* May 16, 1894, Ottumwa, Ia. B.S. in chem. U. of Wash., 1916; chem. Goodyear T. & R. Co., Akron, O., and Toronto, Can., 1916-1917; C. W. S., 1917; asst. chf. chem., Manhattan Rubber Mfg. Co., Passaic, N. J. since 1917. *Member:* Phi Lambda Upsilon, Phi Beta Kappa. *Address:* 55 Morningside Rd., Ridgewood, N. J.

Paul Ingold Murrill, *b.* July 11, 1874, Hickory, N. C. B.S. in chem., U. of Ky., 1895; M.S., 1896, Ph.D., U. of Mich., 1899; research chem., asst. mgr. development dept., European representative and chf. chem. experimental labs., E. I. du Pont Powder Co., 1903-1913; research chem. gen. lab. U. S. R. Co., 1913-1915; supt. TNT plant, Tenn. Copper Co., 1915-1916; supt. dye intermediate dept., Federal Dye & Chem. Co., 1916-1917; consulting chem., 1917-1919; chf. chem. and chem. engr., R. T. Vanderbilt Co., New York, N. Y., 1919-1927; accelerator research since 1914; chem. plant construction and operation; patents on vulcanization accelerators. *Member:* Chemists Club, Soc. Chem. Ind., Am. Chem. Soc., Am. Inst. Chem. Engrs., Kappa Alpha, Mason, Scottish Rite, K. T. and A. A. O. N. M. S. *Address:* 960 West 7th street, Plainfield, N. J.

Ernest R. Bridgwater, *b.* Sept. 30, 1896, Akron, O. U. of Akron, S.B.; chem. eng. M. I. T., 1918; C.W.S. 1918; The B. F. Goodrich Co., Akron, O., 1919-1922; Firestone T. & R. Co., 1922-1924; chf. rubber chem. E. I. du Pont de Nemours & Co., Wilmington, Del. *Address:* Du Pont Bldg., Wilmington, Del.

Marion M. Harrison, *b.* Mar. 27, 1890, Owensboro, Ky.; B.S., U. of Ky., 1912; A.M., Clark U., 1913; Ph.D., 1914; director research, Miller R. Co., Akron, Ohio, 1915-1919, chf. chem. since 1919; Capt. C. W. S.; patents in rubber technology. *Member:* A. S. T. M., Am. Chem. Soc., Torch Club, Mason. *Address:* 334 Merriman Rd., Akron, O.

Ellwood Barker Spear, *b.* Feb. 22, 1875; B.A., U. of Manitoba; post graduate U. of Toronto, U. of Leipsig; Ph.D., Heidelberg 1907; research asst. instructor, asst. prof., asso. prof. of chem., M. I. T. 1907-1920; mgr. research dept. Goodyear T. & R. Co., Akron, O., 1920-1922; chf. chem. Thermatomic Carbon Co., Pittsburgh, Pa., since 1923. *Member:* Am. Chem Soc., A. A. A. S., Chemists Club, N. Y. *Address:* Thermatomic Carbon Co., 108 Ferry street, Pittsburgh, Pa.

Thomas W. Bartram, *b.* Nov. 26, 1896, Canaan, Conn. A.B., in science, Williams Col. 1919; M.S. in chem., M. I. T., 1921; research lab. phys. chem., M. I. T., 1921; research asst., W. B. Pratt, Inc., Newtonville, Mass., 1921-1923; research asst., Rubber Service Labs. Co., Akron, O., 1924-1926; chf., chem. Rubber Service Labs. Co., Nitro, W. Va. *Member:* Alpha Zeta Chapter, Alpha Sigma (M. I. T.), Am. Chem. Soc., Lions Club, Nitro, W. Va., Masonic bodies. *Address:* Nitro, W. Va.

Donald Wentworth Kitchin, *b.* May 4, 1896, Lawrence, Mass.; Phillips Andover Acad.; B.S. in chem., M. I. T., 1921; fixed nitrogen research lab. U. S. Dept. Agri., July, 1921-Sept., 1922; research lab. applied chem. M. I. T., 1922-1924; Arthur D. Little, Inc., 1924-1925; research chem. Simplex Wire & Cable Co., Cambridge, Massachusetts, since 1925. *Member:* Phi Beta Kappa. *Address:* 66 Sidney street, Cambridge, Massachusetts.

Michael Levin, *b.* July, 1894, Baltimore, Md.; B.S., U. of Md., 1915; graduate student Johns Hopkins U., 1917-1918; chem. course Akron U., 1918; graduate student U. of Md., 1923; asst. chem. Firestone T. & R. Co., Akron, O., 1917-1918; C. W. S., 1918-1919 assigned to Bureau of Standards; asst. and asso. chem. till 1924; consult. chem. International Cork Co., 1924-1925; consult. chem. New Process Cork Co., 1925-1926; consult. chem. to cork industry since 1926. *Author:* Bureau Standards pubs., Total Sulphur in Rubber; Determination of Sulphur of Vulcanization; Determination of Antimony in Rubber Compounds. Patents, cellulose-latex combinations, latex-albumen glues, cork and rubber compounds. *Address:* 211 East 92nd street, Brooklyn, N. Y.

John Twiss Blake, *b.* May 16, 1901, Boston, Mass. B.S. Tufts Col., 1921; Ph.D., M. I. T., 1924; instructor Northwestern U., 1922-1923; asst. Tufts Col. 1920-1921; asst. grad. school M. I. T., 1922-1924; research chem. Simplex W. & C. Co., Cambridge, Mass., since 1924. *Member:* Phi Delta, Alpha Chi Sigma, Am. Chem. Soc. *Address:* 66 Sidney street, Cambridge, Mass.

Daniel Repony, *b.* May 2, 1886, Vienna, Austria; graduated 1909 U. of Vienna; asst. chem. Dr. Werber's lab., Vienna, 1909-1911; analyst, Armour & Co., Jacksonville, Fla., 1911; research chem. Manhattan R. Mfg. Co., Passaic, N. J., since 1911; research in mech. rubber goods, solvent recovery; cements, roll compounds; vulcanization and synthetic rubber. *Author:* Technical articles. *Address:* 365 Clifton avenue, Clifton, N. J.

John B. Tuttle, *b.* May 25, 1882, Philadelphia, Pa.; B.S., U. of Pa., 1908; chem. Bureau Standards, printing inks, oils, gums, 1908-1909; asso. chem. rubber, 1909-1918; research chem. Firestone T. & R. Co., Akron, O., 1918; chf. chem. Plant 2, 1919-1920; consult. chem. and rub. tech. since 1920. *Author:* "The Analysis of Rubber," 1922; papers on chemistry of inks, oils and rubber. *Member:* Joint Rubber Insul. Com.; Nat'l. Fire Protect. Asso. Com. Specif. Gasoline Hose; S. A. E. Com. Specif. Airplane Gasoline Hose; Navy Dept. Com. Specif. Rubber Goods; Govt. Com. Specif. Balloon Fabrics; Am. Chem. Soc.; Secy. Rub. Div., A. C. S., 1916-1918; chairman Rub. Div., A. C. S., 1919. *Address:* 133 Harris avenue, Long Island City, N. Y.

David Adelbert Cutler, *b.* Nov. 6, 1879, Wakefield, Mass. Burdett Bus. Col., special in chem. at Wesleyan U., chf. chem. Manhattan R. Mfg. Co., Passaic, N. J., 1902-1906; mfg. chem. Continental R. Co., New York, N. Y., 1906-1909; mgr. development dept. U. S. R. Co., New York, N. Y., 1910-1913; pres. Acushnet Process Co., New Bedford, Mass., 1914-1916; pres. and treas., Alfred Hale R. Co., Atlantic, Mass., and consult. chem. since 1916. Past pres. Rubber Sect. Am. Chem. Soc., 1910-1911. *Member:* University Club, Rotarian, Commons Club, Boston Chamber of Commerce, Quincy Chamber of Commerce. Masonic Shrine. *Address:* Quincy, Mass.

Everett M. Follansbee, *b.* Mar. 6, 1886, Newburyport, Mass.; Brown U.; B.S. in chem. eng. M. I. T., 1911; chem. Simplex W. & C. Co. 1911-1917 and chf. chem. since 1917. *Member:* Phi Delta Theta, Am. Chem. Soc. *Address:* 66 Sidney street, Cambridge, Mass.

Carl Nelson Hand, *b.* Jan. 1, 1892, Gasport, N. Y.; B.S. Hobart Col., 1913; S.B. in chem. eng., M. I. T., 1917; Goodyear T. & R. Co., 1917-1921; Rubber Service Labs. Co., since 1921, pres. and fact. mgr. *Member:* Theta Delta Chi; Am. Chem. Soc.; Lion's Club; Masonic bodies. *Address:* Nitro, West Virginia.

Robert Spreat, *b.* Dec. 22, 1890, Birmingham, Eng. Graduate Municipal Tech. School in chem. and civil eng.; chem. Ajax R. Co., Trenton, N. J., 1912-1914; Engr. Corp. British Army, 1914-1919; chem. Ajax R. Co., 1919-1926; chem. Thermoid R. Co., Trenton, N. J., since 1926. *Member:* Mason. *Address:* 915 Edgewood Ave., Trenton, N. J.

What the Rubber Chemists Are Doing

Organic Accelerators and Anti-Oxidants

Donald H. Powers[1]

THE following is from "The Contributions of the Dyestuff Industry in the Development of the Rubber Industry."[2] The one discovery of this century that has contributed more than any other to the rapid development of the rubber industry is the use of the organic accelerator. Over 90 per cent of the rubber goods now on the market is vulcanized with the aid of these compounds. Not only do they speed up three- to fivefold the rate at which the rubber is vulcanized, which in itself yields an enormous saving, but further, the resulting rubber goods show superior wearing qualities, greater resistance to aging, and much more "life." Only about one per cent of an organic accelerator is needed and it is estimated that this use (by shortening greatly the time of vulcanizing and yielding a more lasting product) annually saves the motorist and the rubber industry $100,000,000.

The rubber industry first recognized the value of organic accelerators just twenty years ago, but it was not until ten years ago that their use became at all widespread. At first the dye-stuff industry supplied the intermediates. It was not long, however, before they manufactured finished accelerators, as they felt that their experience in the making of dyestuffs peculiarly fitted them for this work. They established research laboratories which on the one hand worked out processes which made it possible to offer organic accelerators of a purity rivaling the C. P. chemicals, and on the other hand, studied hundreds of organic compounds for their effect on the rate of vulcanization. As a result of this study entirely new organic accelerators have been developed and placed on the market and still more active bodies under investigation are designed to meet the changing requirements of the rubber industry.

The approximate annual consumption of organic accelerators is estimated at over six million pounds, with a value above $5,000,000. In referring back to the gain effected by the use of accelerators it is evident that this investment by the rubber industry of $5,000,000 yields a saving of twenty times that amount.

It is interesting to note that not only was aniline one of the first organic compounds shown to possess accelerating action but at the present time aniline derivatives constitute 75 per cent of the forty-odd accelerators now on the market. All types of accelerators of commercial application may be listed under six heads, five of which start from aniline.

AMINES. Aniline itself still has some application, but its use has been limited by its poisonous character and relatively weak activity.

THIOUREAS. These products, such as thiocarbanilide and di-ortho-tolyl thiourea, which may be prepared from aniline or ortho-toluidine and carbon disulphide, were first used as nonvolatile nonpoisonous substitutes for aniline. They still enjoy a limited use, but on account of their relatively low activity they have been almost entirely replaced by the newer and faster accelerators.

GUANIDINES. This is the most important class of organic accelerators on the market and their volume equals over 50 per cent of the total accelerator sales. Diphenylguanidine and di-ortho-tolyl guanidine may be considered the reaction products of a cyanogen halide with aniline and toluidine, respectively. As marketed, they are of high uniformity and rival the C. P. chemicals in their purity. Their wide use may be attributed to their relatively high activity, freedom from tendency to prevulcanize, and to the superior qualities of the accelerated stocks. Other guanidines having a wide use analogous in their preparation and activity to the two mentioned above and di-para-tolylguanidine, dixylylguanidine (in England) and phenyltolylguanidine. Triphenylguanidine, which may be prepared from aniline and thiocarbanilide, is a somewhat weaker accelerator than the di-substituted guanidines mentioned, but its volume reaches approximately 10 per cent of total accelerator sales.

ALDEHYDE AMINES. As regards numbers, this class of accelerators far outranks all the rest, comprising over 50 per cent of the total on the market, with each year seeing new additions. One of the earlier members is the condensation product of formaldehyde and aniline, and this, with the toluidine derivatives, still has a limited use. At present the acetaldehyde aniline condensation product is the most important member of this family and is sold as a resinous product under a variety of names. Just as acetaldehyde aniline gives a better accelerator than formaldehyde aniline, so the use of higher aldehydes gives still more powerful accelerators. As a supply of the higher aldehydes such as butyraldehyde and heptaldehyde becomes available, we find corresponding aldehyde aniline derivatives placed on the market. These compounds have been extensively studied, and will no doubt continue to provide new accelerators for several years to come.

MERCAPTO BENZOTHIAZOLES. This class of organic compounds may be considered as derivatives of aniline or its homologs, carbon disulphide, and sulphur. These products heretofore have been limited in their use but will undoubtedly find wider adaptability. It is interesting to note that aniline and carbon disulphide give thiocarbanilide, which is a very weak accelerator, yet aniline, carbon disulphide, and sulphur give mercapto benzothiazole, which is a very powerful accelerator. The metallic salts and oxidation products of the mercapto benzothiazoles are also good accelerators.

THIURAMS. These particular organic compounds are classed as ultra-accelerators and are prepared from dimethylamine, diethylamine, or piperidine, and carbon disulphide. The best known ones are tetramethylthiuram disulphide and tetramethylthiuram monosulphide. However, the very activity of these ultra-accelerators has limited their use. While no direct comparison is possible, the two compounds just mentioned are approximately ten times as fast as most of the accelerators covered in the first four groups. These ultra-accelerators are growing in popularity and finding wider use, especially in the boot and shoe trade. In passing it may be mentioned that the xanthates, which are prepared from alcohol, carbon disulphide, and alkali, are of theoretical interest inasmuch as they are among the few non-nitrogenous accelerators of practical value.

The use of organic accelerators has made possible a far wider application of rubber and in the automobile field we have an interesting illustration of this trend. With the development of balloon tires, rubber suspension springs, and sponge rubber cushions we have reached the time when we are literally "riding on rubber."

Anti-Oxidants

When rubber goods came to be made so that they would wear longer, it became necessary to make them withstand deterioration longer. As a result of years of research it was shown that the deterioration of rubber was due in part to its oxidation and that any prevention of oxidation cut down markedly its rate of deterioration. It was further shown that a relative measure of the rate at which a piece of rubber would deteriorate

[1]E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware.
[2]*Industrial & Engineering Chemistry*, December, 1926, pp. 1344-1346.

could be determined with a fair degree of accuracy by accelerated aging tests. These tests comprised heating a slab of the rubber in an oven at 70 degrees, 80 degrees, or 90 degrees C. for a given number of days or in an oxygen bomb at 60 degrees to 90 degrees C. for a given number of hours. It was shown that in certain types of stocks four days in the oven at 70 degrees C. was approximately equivalent to two years' natural aging, and ten hours in an oxygen bomb at 300 pounds' pressure at 60 degrees C. was approximately equivalent to two years' natural aging, and ten hours of these accelerated aging tests made it possible to study a large number of organic compounds in a short time and select from this number those of value for natural aging tests.

Hundreds of organic compounds had been prepared and tested by the dyestuff industry to study their effect on the rate of the deterioration of the rubber and also to gain further insight into the exact mechanism of this deterioration. As a result of these studies, products were found which retarded the rate of aging in certain stocks as much as sixfold. It meant converting a stock, which would be markedly deteriorated before it was half worn out, into a stock that would show little signs of aging during its entire life. It has been pointed out that this possibility of now obtaining a good aging rubber may greatly increase its use and also open new fields such as the building trade. These organic anti-oxidants have been found to be extremely active, and one to five per cent is all that is required in the majority of stocks.

While anti-oxidants have found their principal demand in the tire industry, the advantages of their use in household goods are obvious and their spread to this field is only a question of time. An instance of a recent important demand for anti-oxidants is in tubes for passenger buses. The ordinary tube deteriorates completely in many cases within a week, but by the use of the organic anti-oxidant tubes are now on the market which show practically no deterioration during their life.

Chemical Patents

United States

1,614,541. TREATMENT OF BALATA AND GUTTA PERCHA. Extraction of thin resins with a solvent progressively lower in resin content, dissolving the deresinated material in fresh solvent, intimately mixing the resultant solution with an inert decolorizing agent, removing the agent and finally precipitating the balata product.—Claude H. Smith, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

1,614,935. ETCHING RUBBER SHEETS. The sheets are subjected to a superficial supervulcanization, producing the desired design upon it, after which it is covered with a mixture of fatty and resinous substances, and etched with a solution of nitric acid and potassium bichromate.—Etienne Sardou, Marseille, France.

1,616,378. ACCELERATOR. Vulcanization is assisted by the addition of a small amount of a condensation product of alpha-beta-substituted acroleines with aromatic amines.—Walter Kropp, Elberfeld, assignor to I. G. Farbenindustrie Aktiengesellschaft, Frankfort, both in Germany.

1,616,936. ACCELERATOR. An unsymmetrical tri-substituted guanidine is combined with rubber as a vulcanizing ingredient.—Morris L. Weiss, Newark, New Jersey, assignor to Dovan Chemical Corporation, New York, N. Y.

1,616,994. ACCELERATOR.—Lorin B. Sebrell, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

Dominion of Canada

267,734. ACCELERATOR. The product formed by treating with caustic the reaction product of cyanamid with the salt of an aryl amine.—The Roessler & Hasslacher Chemical Co., New York, N. Y., assignee of Carl Stuart Williams, Woodbridge, New Jersey, U. S. A.

267,990. ACCELERATOR. A physical mixture including a number of substituted guanidine compounds, one of which contains unlike substituted radicals.—Albert C. Burrage, Jr., Ipswich, Massachusetts, U. S. A.

United Kingdom

261,700. COATING FABRICS WITH RUBBER. Continuous process for coating fabrics with rubber including their vulcanization.—Kodak, Ltd., Kodak House, Kingsway, London, assignees of S. E. Sheppard and L. W. Eberlin, Kodak Park, Rochester, New York.

261,748†. RUBBER SUBSTITUTES. Products resembling rubber are made by heating a polymerized vinyl alcohol, or a derivative or homolog such as an ether, ester or acetal, with sulphur or a sulphur compound.—Consortium für Elektrochemische Industrie, Ges. Munich, Germany.

261,879. FIBROUS PLASTIC COMPOSITIONS. Leather waste is reduced to fiber, dried and incorporated with rubber solution to form a paste, which is kneaded and dried to form a plastic mass. A vulcanizing agent may be added and the product vulcanized in molds.—R. Meyer, 21 Auf dem Dorn, Hanover, Germany.

261,928. WATERPROOF INSOLE MATERIAL. Leather or fabric in the piece is coated or impregnated with a compound of plaster of Paris and one or more adhesives such as rubber, gum, dextrin, resin, pitch, and wax or oleaginous matter.—A. F. E. De St. Dalmas, Facotena, Lansdown Road, Sidcup, Kent.

262,179. FOROUS RUBBER. Latex is coagulated to a homogeneous cohesive jelly and vulcanized without allowing it to become dry. The coagulation is effected either by treating the latex with a gaseous acid, such as sulphurous acid, or by converting it into a thick, paint-like pulp by the admixture of alum, zinc sulphate, ferric chloride, or the like, and subsequently coagulating with a liquid or gaseous acid.—H. Beckmann, 26, Albertinenstrasse, Zehlendorf, Berlin, Germany.

262,313. ADHESIVE FOR RUBBER OR LEATHER. A composition consisting of gutta percha, carbon-tetrachloride, and benzol, with or without coloring matter such as antimony sulphide or lampblack.—D. M. R. McCubbin, 179 North Road, Wallsend-on-Tyne.

†Not yet accepted.

COMMITTEE D-13

The regular spring meeting of Committee D-13 of the American Society for Testing Materials will be held on March 11 and 12 at the Massachusetts Institute of Technology, Boston. A general invitation is extended by the officers of the committee to any of the textile industry who may care to attend.

In addition to committee reports the committee in charge of the meeting has arranged for some very interesting papers. The buildings of the Institute will be opened for inspection affording an excellent opportunity to learn what the Institute is doing in its textile laboratories for the cotton industry.

SPRING MEETING A. C. S.

The Seventy-third meeting of the American Chemical Society will be held in Richmond, Virginia, April 11 to 16. Divisional meetings will take place on the 13th and 14th. The program of the Rubber Division will be announced in our April issue.

TIRE INVENTORY—PRODUCTION—DOMESTIC SHIPMENTS

After a decline for several months to the low figures of last November, the production and shipments of high pressure casings, balloon casings, and both classes of inner tubes showed a decided advance for December. Shipments in December of balloon casings rose to 1,537,085, as compared with 1,273,562 for November, the corresponding figures for balloon inner tubes being 1,628,872 for December and 1,243,944 for November, while shipments of high pressure inner tubes rose from 1,790,429 in November to 2,468,262 for December.

A favorable falling-off in inventory is also indicated in the figures for both classes of inner tubes and also for balloon casings, the decline being especially noteworthy in the totals for balloon inner tubes, 4,384,791 for November to 4,133,865 for December. There has been a gain in inventory, however, for both fabric casings and solid and cushion tires, although shipments of the former class of goods have increased in December, the first advance since August.

Consumption of cotton fabric in December by tire manufacturers was the smallest of the year, 11,592,667 pounds, while the total amount used during 1926 stood at 165,963,182 pounds, as against 168,295,927 in 1925 and 142,415,356 pounds in 1924. Crude rubber consumption in December at 37,117,457 pounds represented a gain over the November figure, but the total for the year, at 518,043,062 pounds, was a decided falling-off from that of 1925 at 552,389,272 pounds. The August consumption of crude rubber was the highest of the past year, at 49,840,601 pounds.

	December, 1926		
	Inventory	Production	Total Shipments
High pressure cord casings	4,047,557	1,857,821	1,861,272
High pressure fabric casings	652,993	151,436	140,251
Balloon casings	3,141,505	1,502,724	1,537,085
Solid and cushion tires	164,294	44,489	38,557
High pressure inner tubes	8,016,198	2,517,035	2,468,262
Balloon inner tubes	4,133,865	1,440,646	1,628,872

COTTON AND CRUDE RUBBER CONSUMPTION IN TIRES AND TUBES

	Pounds
Cotton fabrics	11,592,667
Crude rubber	37,117,457

Rubber Association figures representing 75 per cent of the industry.

Cord Tire Fabrics[1]

Hysteresis Fatigue Test — Raw Cord Flexing Factors — Rubber Impregnation Methods — Correlation of Flexing Test with Tire Service

F. W. Stavely and N. A. Shepard[2]

In the early development of pneumatic tires, the principal fabric used in tire construction was square-woven. It was not until about 1915-16 that the advantage of the present type of cord fabric construction was definitely established. This tire fabric differs from the square-woven in that the cross threads are nearly eliminated. The warp cords are from 20 to 26 ends per inch while there are only 2 to 6 weft or filler threads per inch. The cord itself may consist of as many as fifteen strands, twisted into a single unit, constructed as in Figure 1, while the filler thread consists of a single strand. This makes a very loosely constructed fabric.

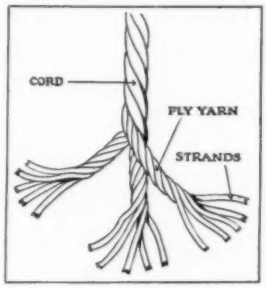


Fig. 1—Cord Construction

The introduction of cord fabric eliminated the chafing action of the ply yarns which cross each other in square-woven fabric and made it possible to insulate the cords completely from each other with rubber. This change was fundamental in improving the quality and life of the pneumatic tire.

Cord break in pounds and elongation at break are not necessarily sufficient for the proper evaluation of a fabric. Gurney and Davis[3] have emphasized that "color elasticity, or ability to return after stressing to its original dimensions, is not necessarily involved in tensile strength and elongation at rupture." All of the above investigators also called attention to the fact that failure of a cord or fabric in tire service follows from the cumulative effect of frequently applied stresses. Gurney and Davis place some emphasis on the effect of permanent set in a cord, for they call attention to the fact that the greater the ratio of percentage elongation to percentage set at a given load, the better the recovery for a given elongation.

Hysteresis as a Fatigue Test

It should be pointed out that the relationship of elongation (stretch and elasticity) to permanent set (lost stretch) during the first cycle in which a cord is subjected to a given load or series of loads is quite different from that of the subsequent cycles. While this is true with many materials it is very pronounced in cotton cords since these consist of a large number of cotton fibers twisted together. The marked loss in the elongation of the cord during the second cycle, compared with the first, is probably because most of the slippage and tightening of the fibers occurs during the first cycle. A somewhat similar change occurs in the cord during the processing of the fabric and the expansion and curing of the tire. Thus the initial elongation of a raw cord is not an index of its behavior in tire service. The flexing of a tire subjects a group of cords to repeated and variable stresses. The behavior of an individual cord isolated from a tire and subjected to a flexing action may be quite different from its behavior when surrounded by rubber and other cords. Nevertheless a study of single cords offers a method of obtaining information regarding some of the factors that influence the flexing life.

Flexing Machine

The flexing machine[4] used in this study was of such a nature that the angle of flexing could be varied. It was equipped with counters which automatically recorded the number of flexes required to break the cord. Twelve cords could be tested simultaneously and the breaking of one cord did not interrupt the testing of the others. The tension on the cord was nearly constant.

Factors Influencing the Flexing of Raw Cords

Humidity is an important factor in the testing of cotton fabrics. It was therefore necessary to determine the influence of humidity on the flexing test. Since conditions were such that it was not possible to carry out the test at a constant relative humidity, the average relative humidity while the cords were being tested was used. The humidity conditions could not be duplicated, therefore it was possible to obtain only from 7 to 14 tests. The results indicated that humidity has an appreciable influence on the flexing test, and accordingly, where it is not possible to test at a constant humidity, all comparative tests must be made at the same time.

High temperature, such as frequently occurs in overloaded tires, has a marked effect on the flexing life of cords. While it has not been possible to determine the effect of variations in room temperature on the flexing test, in view of the marked effect at high temperatures, it is desirable that all comparative tests be made at the same time. There is a marked decrease in the flexing life of the cord as the temperature increases. It is possible that this may be due to a decrease in the moisture content of the cord or a change in the physical characteristics of the cotton fibers that constitute the cord.

The natural lubricants present in cotton, which are known to fluctuate somewhat, have an influence on the flexing life of the cord. The removal of the acetone- and benzene-soluble, waxy constituents of the cotton cord lowered the flexing life approximately 30 per cent.

Average Tests

In this investigation the average of 40 or more tests was taken as an indication of the trend of a given type of cord. If in tire service each cord is subjected to approximately the same load, it is possible that the type of cord that gives a comparatively large number of low breaks will not hold up as long as that type which gives fewer low breaks. Combed cotton contains a greater proportion of fibers of approximately the same length than carded cotton, it was therefore anticipated that combed cotton would contain fewer cords having a low flexing life than carded cotton and such is the case. Also there are always some cords that flex appreciably longer than others. Sometimes this increase amounts to 200 to 300 per cent more than the average value.

The fact that cords from a particular fabric show poorly on the flexing machine is no proof that such a fabric is unsuitable for tire construction. For example, a 7/2/2 carded American

---

[1] Presented before the Division of Rubber Chemistry at the 72nd Meeting of the American Chemical Society, Philadelphia, Pa., September 5 to 11, 1926. Condensed from *Industrial & Engineering Chemistry*, February, 1927, pp. 296-301.

[2] Firestone Tire & Rubber Co., Akron, Ohio.

[3] *India Rubber Journal*, 70, 267, 1925.

[4] Designed and constructed by R. W. Brown, Engineering Laboratory, Firestone Tire & Rubber Co., Akron, Ohio.

cord (from a tire) may flex an average of 800 times before failure, while a 23/4/3 carded Egyptian cord (from a tire) may flex 3,500 times. This does not indicate, however, that the 7/2/2 fabric will not meet the requirements in certain types of tires. In other words, the flexing test may be used as a criterion of fabric performance only when the use of that fabric results in its premature failure. In the event of fabric failure, the flexing test is of value in determining what change in the fabric would be beneficial. The test may be used to determine the desirability of changes in cord construction and to determine methods of improving the flexing life of a given fabric.

Methods of Influencing Cord Fatigue

Heretofore it has been the general practice to change the construction of a fabric if it is not performing satisfactorily in tire service. It is of interest to determine how the flexing life can be increased without changing the construction. An excellent method of accomplishing this is through proper impregnation by means of rubber cements containing compounding ingredients.

Impregnation

As previously pointed out, the elimination of square-woven fabric revolutionized the pneumatic tire industry. This was due in no small measure to the insulation of the cords from each other. Therefore one would conclude that it would be desirable also to rubber insulate the individual strands that constitute a tire cord.

At present the three principal methods of processing cord fabric for use in tires are as follows: (1) Treating the fabric with a rubber cement which may also contain vulcanizing ingredients such as sulphur, and other compounding materials. This process may subsequently be followed by a frictioning of calendering process. (2) Treating the fabric with latex, which may contain emulsifying and vulcanizing agents. This process may also be followed by frictioning or calendering. (3) Forcing the rubber containing vulcanizing ingredients into the fabric by friction calendering without preliminary treatment.

The solvent or dispersing medium, which contains the rubber, largely determines the degree of impregnation. Water, for example, does not readily wet cotton fibers and therefore does not spread or flow over the surface of the cord. Without such wetting action there is considerable resistance to penetration. On the other hand, rubber solvents such as benzene or carbon tetrachloride readily wet cotton, and through capillarity a tire cord is quickly saturated when brought in contact with these solvents. The same is true of rubber cement made from these solvents. When a cord comes into contact with such a cement, it becomes almost instantly saturated with the solvent, while it is difficult to wet even the surface of the cord in water dispersions of rubber.

The question naturally arises as to whether the rubber travels with the solvent in a rubber cement. This may be readily demonstrated by a simple "wick test" carried out by placing two small beakers in a glass jar fitted with an airtight ground glass lid. A rubber cement, made with benzene, is placed in one of the beakers. One end of a bundle of cords is placed in this with the other end extending into the empty beaker, thus connecting the beakers with a wick. The jar is then sealed and in the course of a few days, depending on the viscosity of the rubber cement, it is found that a portion of the rubber cement has passed through the wick and been deposited in the empty beaker. Colloidal dispersions of rubber in water, such as latex, will not behave in this manner. These results indicate that with a proper impregnation process such as treatment with a rubber cement, it should be impossible to impregnate thoroughly each and every strand that constitutes the cord.

Just as insulating with rubber protects the cords in a tire against friction with adjacent cords, so also rubber protects cotton from the various chemical reagents which attack it. This protective influence of rubber may be utilized in studying the penetration and distribution of rubber throughout a tire cord. For example, sulphuric acid destroys the unprotected cotton fibers almost instantly, but if the fibers are protected by rubber, the action of the acid is noticeably retarded, although ultimately the acid will also attack the rubber.

Effect of Impregnation on Fatigue

Raw cords from carded Egyptian fabric were tested simultaneously with impregnated cords taken from the same roll of fabric and cured in a tire. The raw cords flexed 8,910 times (average) before failure, and the impregnated cords taken from the cured tire flexed 15,910 times (average), an increase of approximately 78 per cent. The results indicate that the proper impregnation of cord fabric by means of a rubber cement makes it possible to increase appreciably the flexing life of the cords.

Correlation of Flexing Test with Tire Service

Preliminary results indicate that there is a correlation between the behavior of cords on the flexing machine and the behavior in tire service. Such a correlation obviously can be shown only where tire failure is entirely due to fabric failure. In a case where tire failure with a certain fabric was due to circumferential shoulder breaks at approximately 8,000 miles road test, cords taken from similar tires before going into service and tested on the flexing machine flexed 2,150 times (average) before failure. With no change other than increasing the flexing life of the cords in this type of tire to 3,430 flexes, there resulted an increase in mileage of approximately 50 per cent.

Such a result would indicate that the increase in mileage is proportional to the increase in flexing life. That this is not consistently the case has been found in further tests. However, the results are such as to indicate that the flexing test is of distinct value in the study of cord tire fabrics.

THE ECONOMICAL TAPPING PERIOD

T. G. E. Hoedt describes in the *Archief voor de Rubbercultuur*, November, 1926, a test made to ascertain to what extent the most economical tapping period could be determined by previous calculation of the flowing period, so that a certain method could be selected with a guarantee that most profitable results would be obtained.

The test was based on previous experiments which showed that the average daily production obtained by periodical tapping increases from the first day of a flow period to a maximum after which it declines and it was explained that by finding the most economical period of tapping an increase in production might be obtained.

An economical flow period of 15 days (theoretically determined from 30-day flow periods) was compared with alternate daily tapping. Theoretically it had been calculated that the 15-day period would show a gain of 12-13 per cent. The actual test gave an increase in favor of the 15-day period of 19 per cent, during the first 6 months. During the last 4 months the difference averaged 27 per cent. From this it follows that by finding when the highest daily average production was obtained, it would be possible to work out a flow period by which the utmost profit could be derived from the number of days in the tapping period.

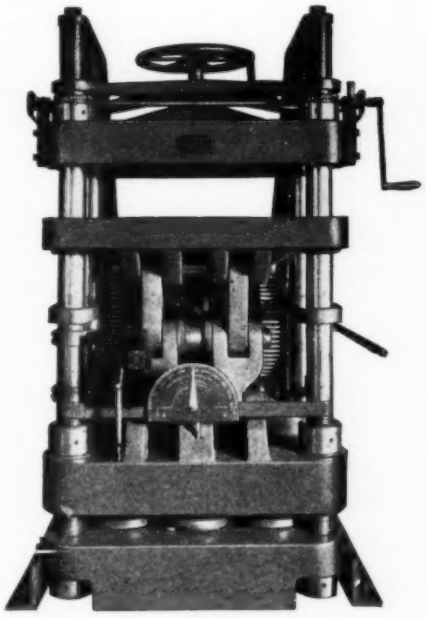
These results may be considered applicable only to plantings of about the same age, on similar soil and same elevation above the sea. For other plantings, an economical tapping period can be found by a simple calculation.

SHIPMENTS OF RUBBER BELTING FROM THE UNITED STATES TO Mexico during the past three years are reported by the Department of Commerce as follows: (1924) 419,866 pounds, value $247,615; (1925) 499,443 pounds, value $299,155; and (1926) 386,296 pounds, value $265,063. There is little demand for balata belting.

New Machines and Appliances

Mechanical Spring Press

A NEW type of curing press for making molded articles of rubber and other plastic material is here pictured. Its chief feature is that being operated entirely by mechanical means the necessity of hydraulic equipment is eliminated. The cost of its maintenance is trifling compared with that of hydraulic machinery. The press is virtually a machine tool requiring only proper lubrication. It is operated by individual motor compound gearing, cam and toggle. Specially constructed springs retain the pressure while curing, the motor being shut off.



Terkelsen Rubber Press

To operate the press a friction clutch is thrown into engagement by a lever at the side thus causing the press to close. It is automatically stopped at the top and bottom of the stroke. The curing period may be operated mechanically if desired by attaching a timing device, that will control steam and water at desired intervals and automatically cause the press to open at the expiration of the curing period. Such an arrangement allows one man to operate more than one press at the same time and controls the length of cure.

The press is a complete molding unit built for any tonnage, number and size of platens and stroke. An important incidental feature is its saving of space otherwise occupied by hydraulic power appliances.—Terkelsen Machine Co., 326 A street, Boston, Mass.

Tubing Machine Refinement

Prior to the Great War, two qualities of tubing machines were offered to the trade, one was the Perfected line and the other an earlier type well built, practical, but less developed. The latter were sold at practically half price for corresponding sizes, in the expectation of serving the close buyer. None were ever sold, however. Customers invariably chose to pay the higher price to get the better machine.

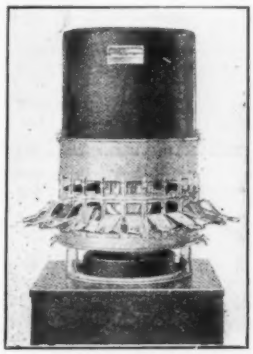
A machine that lacks the refinements and conveniences of its best competitor is never satisfactory to the user, because labor hours and rubber stocks are costly while machine hours are very much less so in comparison.

The extra labor required to operate a second class machine, or the production hours lost now and then through inefficient design, quickly wipe out the difference in cost. This loss is a liability on the machine that it can never repay.—John Royle & Sons, Paterson, New Jersey.

The Age-Ometer

Effective apparatus and methods for accelerated aging of rubber goods depend on heat and oxygen under pressure.

The illustration represents an apparatus utilizing the violet carbon arc for accelerating aging on vulcanized rubber. A similar arrangement has been used for testing the fastness of colors on textiles. The arc is maintained absolutely constant by automatic mechanism contained within the instrument cabinet. The arc stream plays between special electrodes and develops a spectrum containing ultra-violet and other rays present in the spectrum of sunlight. Having the same actinic properties of sunlight, the arc produces the same chemical reactions as sunlight. The instrument is made in two sizes, exposing 16 and 20 specimens respectively.



Atlas Age-Ometer

A cabinet surrounds the arc and encloses all of the controlling mechanism. Around its base openings are located equally spaced from the arc at a distance based on relative sun and arc light values. Each exposure receives identically the same light per unit of area, thus providing for numerous identical tests at one time. The special spring clip holders are inclined at such an angle that the part of the test sample under strain is presented directly toward the arc thus assuring concentration of the destructive rays upon the desired region.

The standard distance of the sample from the arc is 10 inches. An equal number of test openings encircle the cabinet above those for the specimen holders mentioned. These are intended for exposures of snatches of color and can be closed when not in use.—Atlas Electric Devices Co., 360 West Superior street, Chicago, Illinois.

Paper Tearing Tester

The quality of paper is of great importance in arts and manufacture, both economically and technically. Paper quality is dependent in chief degree upon the quality of fibers used in its making. If it contains good fibers it will probably show good strength if torn across the grain but if there has been failure to make an excellent bond of all the fibers the paper will tear easily with the grain.

Elmendorf Tearing Tester

A means of measuring with precision the wearing quality of paper by the tear in both directions is afforded by the tester here illustrated. The instrument has a heavy pendulum or sector mounted on ball bearings. The sector carries a clamp and a dial graduated from 0 to 100. On the same axis a pointer is mounted which has a constant friction, just sufficient to stop at the highest

point reached by the swing of the sector. If the sector is raised 70 degrees from the vertical and allowed to rest against the stop when the latter is depressed the sector will swing to 70 degrees, and the pointer will rest at zero.

Biggs' Ten Foot Quick Opening Door Heater

To make a test the sector is lifted and several strips of paper are clamped in the jaws, the pointer is set and the cutter handle depressed to start a tear of definite length. When the stop is depressed the sector will swing but will not rise to 70 degrees because part of the energy of the lifted sector is spent in tearing the paper. The dial reading shows the work done in tearing the sample.—Thwing Instrument Co., Philadelphia, Pennsylvania.

Largest Quick Opening Door Vulcanizer

The largest vulcanizer ever built complete with quick opening door is 10 feet diameter by 40 feet long and is shown in the accompanying illustration. It is designed for 150 pounds operating pressure and notwithstanding the enormous size of the door it can be opened and closed by one man without the aid of mechanical assistance. This vulcanizer has been installed for curing linings in large steel tanks, although they are usually installed for curing rubber footwear or other articles supported on racks in cars.—The Biggs Boiler Works Co., Akron, Ohio.

Strip Cutting Machine

A machine for cutting strips of rubber and fabric as well as cured rubber is indispensable in many lines of rubber manufacturing such as footwear, tapes, and tire flaps.

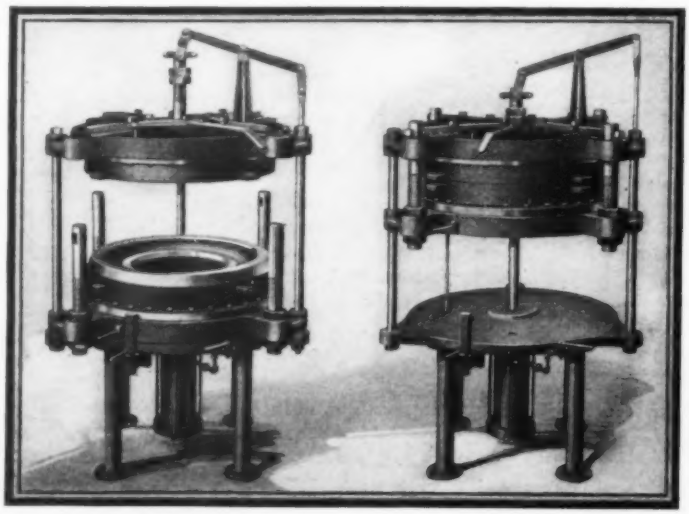
The Judelshon cutting machine is particularly adaptable for this work owing to its flexibility, strips of various widths being cut from the same roll without removing from the machine. The roll of goods is placed on the shaft of the machine and fastened to a steel plate by means of steel pins. Starting the power causes the goods as well as the cutting knife to revolve. Now it is a matter of simply turning the wheel to size of strip desired, and cutting goods even to 1/64 inch. Bias bindings used on tennis footwear are cut and then run on a spooling machine for folding.—Oscar I. Judelshon, 36 East 8th street, New York, N. Y.

Inner Tube Molding Press

The adoption of the steam jacketed mold for curing inner tubes created a need for an accurate registering, quick operating, instant locking press. These features insuring the internal pressure on the tube are of prime importance. A delay after the tube touches the hot mold means the difference between a perfect tube and a defective one.

The design of the press here pictured in open and closed positions, insures proper alinement and register of the mold. The latter is closed tightly all around every time and minimizes the rind. Excessive rind or flash on a tube indicates a thin spot or other defect within the tube.

The horizontal portion of the mold is ideal for the operator, enabling him to work in the most natural position, eliminating sagging or pinching the tubes and making it easy to change molds. The press and mold tilt slightly to the rear, providing perfect drainage and even temperatures and maximum production of good tubes at minimum cost of labor.



OPEN CLOSED

Instant Locking Tube Vulcanizing Press

As indicated in the illustrations the press has a fixed head, a moving lower platen actuated by an air cylinder, a bed plate with legs and a quick locking mechanism.

A simple but effective outside locking device consists of a central steel disk rotatable through a quarter turn and carrying an operating handle. Four steel cranks are pivoted to this disk and to sliding bars with tapered ends completing a powerful toggle mechanism. Attached to the moving press platen are four 3-inch steel posts threaded at one end and pierced with oblong holes at the other. The tops of these holes are tapered to conform to the taper on the sliding bars of the toggles. When the lower platen is raised to closed position these 3-inch posts pass through holes bored in the upper platen. A pull of the operating lever drives the heavy toggle wedges into the tapered holes of the uprights, securely locking the mold shut. Reversing the movement unlocks the press. The vertical locking posts afford a very close adjustment to suit the thickness of any mold.

The inside lock consists of a spiral breech block mechanism actuated by the same handle that sets the outside lock. When the press opens to discharge or to receive a tube, the lock is automatically drawn up out of the way by the lever arrangement shown in the picture. As the press closes the lock moves down to a point within the lower platen. A pull of the operating lever rotates and engages this lock, with the effect of a powerful screw. Adjustment is made by the nuts near the top of the center post. The locking mechanism in no way interferes with the pressman's operations.

The safety and convenience of the operator, who can take care of a number of these presses, has been considered in making the lower platen the moving member. This feature, together with a safety latch, obviates all danger of the workman being caught and injured. The large opening of 30 inches between platens, convenient openings through platens and other details contribute to the efficiency of the press.—The Akron Equipment Co., Akron, Ohio.

Horizontal Disk Grinder

A convenient electrically operated horizontal disk grinder is here illustrated. It is particularly suited for facing any flat rubber surface such as valves, blocks, etc., and is faster than a vertical disk sander or grinder.

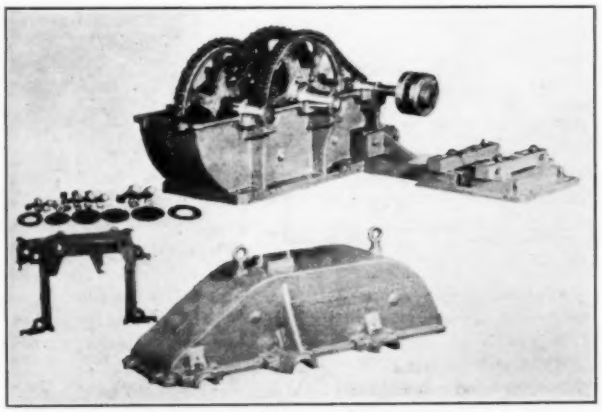
Porter-Cable Horizontal Grinder

The heavy iron disk, upon which the cutting surface is fastened, is carefully balanced after machining. It is supported by an oversize thrust bearing built into a special G. E. motor, and operated from a lamp socket. The machine is controlled by a two-pole push button switch located in the pedestal, in which all wiring, except the rubber covered conductor cable, is concealed. For convenience in changing abrasives, two disks are furnished.

A special feature of the machine is its vacuum dust remover, a simple device consisting of fins cast into the back of the metal disk, proper outlets for the dust and a metal hose to carry it away. The revolutions of the disk produce a vacuum in the outlets which draw in the dust and discharge it through the exhaust hose.—The Porter Cable Machine Co., Syracuse, New York.

Chain Drive Speed Reduction

The illustration represents a chain driven type of speed reduction unit. Its mechanism comprises automatically self-lubricated chains and sprockets offering certain advantages. For example, in this unit they run in oil, assuring durability. Chains have no back lash, and all wear of the sprockets is automatically taken up as fast as it occurs. In operation the chain mounts the teeth and takes up all the slack and transmission efficiency and silent operation is preserved.



Chain Drive Speed Reduction

In the unit here referred to, split steel sprockets are used, making possible quick and inexpensive replacements without disturbing shafts or sprocket hubs. The use of high speed chains makes it possible to drive direct from the motor shaft. Chains not only transmit power in the same direction without use of idlers, but a larger number of teeth are in continual contact with the chain than is possible with gears.—Washington Machinery Depot, 1924 Pacific avenue, Tacoma, Washington.

Machine for Separating Tire Treads and Plies

Treads are removed from old pneumatic automobile tires and the plies are separated for salvaging the fabric by a French machine of special design. The debeaded tires are fed flat into one end of the machine. The treads are pulled off by winding on a spindle while the fabric is pulled apart on a cylinder. The tread and plies are delivered rolled or coiled from the last section of the machine. The fabric plies are cut in their entire thickness as soles for shoes for mountain climbing while the treads are converted into reclaimed rubber.—Raymond Marie, Colombes (Seine), France.

Process Patents

United States

1,614,989 Composition shoe heel. James A. Mulherin, assignor by direct and mesne assignments to Henry Delkeskamp, both of St. Louis, Missouri.

1,615,156 Heels. John J. Batterman, Brookline, assignor of one-half to John J. Daly, Newton, both in Massachusetts.

1,615,992 Tube manufacture. Charles Edgar Maynard, Northampton, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,616,069 Tire construction. John C. Tuttle, John P. Smith and Martin L. Wiener, assignors to The Firestone Tire & Rubber Co., all of Akron, Ohio.

1,616,108 Method of covering top roll. Howard Stanley Bristol, Newport, Rhode Island.

1,616,901 Making multiply waterproof sheets. Lester Kirschbraun, Chicago, Illinois.

1,616,902 Making multiply waterproof sheets. Lester Kirschbraun, Chicago, Illinois.

1,616,903 Process and apparatus for making paper. Lester Kirschbraun, Chicago, Illinois.

1,616,904 Emulsion and method of producing same. Lester Kirschbraun, Chicago, Illinois.

1,616,921 Waterproof composition. Chester E. Rahr, Brookline, Massachusetts, and Lester Kirschbraun, Evanston, Illinois.

1,617,049 Art of attaching rubber heels. John B. Hadaway, Swampscott, Massachusetts, assignor to United Shoe Machinery Corporation, Paterson, New Jersey.

Dominion of Canada

267,479 Rubber splicing. The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, assignee of Erwin Emil Albert George Meyer, Detroit, Michigan, U. S. A.

267,810 Tire. Ernest Hibbert, Goulburn, New South Wales, Australia.

268,094 Insulated conductor. The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, assignee of Thomas Baker Heustis, Bristol, Rhode Island, U. S. A.

268,111 Tire. The Goodyear Tire & Rubber Co., assignee of Wayne Le Roy Tourtellot, both of Akron, Ohio, U. S. A.

268,116 Cushion tire. The Goodyear Tire & Rubber Co., assignee of Richard S. Burdette, both of Akron, Ohio.

268,179 Heel. Joseph Edwin Markham Cooke, Stafford, England.

United Kingdom

261,705† Molding rubber shoes. H. C. L. Dunker, 6, Kungsgatan, Helsingborg, Sweden.

262,256 Yarns. Dunlop Rubber Co., Ltd., W. H. Paull and R. Truesdale, Fort Dunlop, Erdington, Birmingham.

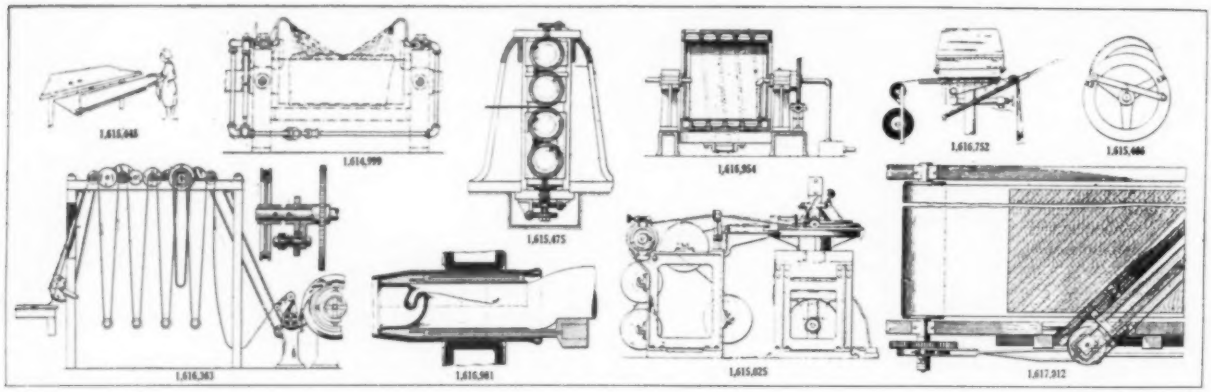
262,387† Dentures. H. Estelmann, Eibach, Nürnberg, Germany.

262,410† Molding dentures. Ohio Chemical & Manufacturing Co., 1177 Marquette street, assignee of M. L. Axelrod, 11310 Gray avenue, both of Akron, Ohio, U. S. A.

262,465† Insulating electric cables. M. Kubierschky, 88 Kommandentenstrasse, Lichterfelde and Akt.-Ges. Mix & Genest Telephon Und Telegraphen-Werke, 5 Geneststrasse, Schöneberg, assignees of M. Kubierschky, 88 Kommandentenstrasse, Lichterfelde, and O. Gergacsevics, 5 Geneststrasse, Schöneberg; all of Berlin, Germany.

†Not yet accepted.

THERE HAS BEEN A DECIDED DECLINE IN THE PAST YEAR IN American exports to the United Kingdom of rubber belting, the following figures representing the totals for the past three years: 1924, 401,236 pounds; 1925, 412,185; and 1926, 270,664.



Machinery Patents

United States

1,614,999. MILLING PLASTIC MATERIALS. The temperature of a rubber compound during milling arises chiefly from the disrupting force exercised on the rubber at the "bite" of the mill rolls. Control of this temperature is effected by directing a spray of chilled water vapor against the bank of rubber through an injector system of piping and nozzles operated by compressed air.—Frederick F. Sutherland, assignor to Kelly-Springfield Tire Co., both of Cumberland, Maryland.

1,615,025. BEAD BUILDING MACHINE. In building composite tire beads of annular form, coverings and reinforcing fabric is fed from rolls under tension to cover the strands of bead wire laid in a cavity of bead form. The latter is supported on a rotatable mechanism with suitable guides to direct the bead construction. The semi or complete vulcanization of the rings thus formed finishes the bead for use in making tire casings.—Alphonso H. Marietta, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

1,615,445. POCKET BUILDING TABLE. Endless fabric bands of two or more plies in thickness are accurately built to the desired circumference on this device, which consists of a flat board pivoted at its center. The first ply is held securely at one edge by a clip, which is not used during application of subsequent plies, but lies smoothly out of the way.—Charles H. Desautels, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, Massachusetts.

1,615,466. FORMING BEAD WIRES. This invention facilitates winding, splicing and soldering bead wires in ring form for bead edges of casings. The ends of a large number of multi-strand bead wires can be constructed at the same time without the large number of loose ends incident to their separate manufacture. Also they may be soldered automatically without danger of the solder being applied to other portions of the bead ring.—Charles E. Maynard, Northampton, assignee to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,615,475. CALENDER. A four-roll calender in vertical stack arrangement, of which the adjustment of the rolls is such that a two-ply sheet of accurate thickness can be formed between the upper and lower pair of rolls.—Thomas Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,616,363. FESTOONING RACK. This rack is roll-driven, supporting and feeding the loops or festoons of spliced tire building fabric. The lengths of the festoons are maintained in determinate relation as the quantity of material in the rack varies without the strain upon the work necessary in drawing it through the usual form of rack.—John R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,616,752. MACHINE FOR CUTTING BLANKS FROM SHEET MATERIAL. A number of rubber blanks are cut simultaneously and delivered on the cloth leaf of a stock book. The sheet is held against a die plate perforated in the shape of the blanks to be cut. A presser roll passes forward and back over the sheet and forces cutting knives through it. The cut blanks fall through the die plate openings to the stock book.—Frank J. MacDonald, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,616,954. VULCANIZING APPARATUS. Articles are vulcanized in separate molds while traveling in series along a spiral path of motion within the vulcanizer. Provision is made for the entrance and exit of the molds when the curing is completed. The vulcanization process is thus continuous and is specially adapted for rubber heels.—John L. G. Dykes, Chicago, Illinois.

1,616,981. TUBE SPLICING MANDREL. The hinged gate feature of the ordinary tube splicer is eliminated and a novel device for closing the slot is substituted. This is a special heat insulating device which reduces the number of operations involved in properly positioning the tube upon the mandrel.—Robert J. Milligan, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

1,617,012. BIAS CUTTER. A horizontal machine in which the fabric is fed without tension, thus eliminating all stretching and distortion. The fabric is supported and fed by a conveyer belt spaced above a slotted bias bar at the point of cutting, to prevent the band knife from injuring the belt.—Harold A. Denmire, assignor to The General Tire & Rubber Co., both of Akron, Ohio.

1,614,892 Tire building machine. Bernard F. McGovern, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

1,615,469 Tire mounting and demounting machine. John McKenzie, Quincy, Massachusetts.

1,615,470 Tire mold. Thomas Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,615,471 Method of making tire molds. Thomas Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls, Both in Massachusetts.

1,615,472 Tire mold. Thomas Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,615,473 Tire mold and method of making same. Thomas Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,615,474 Tire mold. Thomas Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls, both in Massachusetts.

1,615,943 Device for inflating and deflating pneumatic tires. William A. Harris, assignor to G. & H. Tire Chuck Gauge Co., Inc., both of Greenville, South Carolina.

1,616,066 Apparatus for repairing tires. Clyde M. Semler, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.

1,616,076 Tire vulcanizing apparatus. Emmett W. Cotton, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.

1,616,959 Expansible core. Andrew Huetter, assignor to The Artyr Co., both of Dayton, Ohio.

1,617,013 Fabric cutting machine. Harold A. Denmire, assignor to The General Tire & Rubber Co., both of Akron, Ohio.

Reissue

16,542 Vulcanizing apparatus. Walter L. Fairchild, New York, N. Y. Filed December 14, 1926. Serial No. 154,829. Original No. 1,588,668, dated June 15, 1926. Serial No. 521,391, filed December 10, 1921.

Dominion of Canada

267,480 Electrical conductor making apparatus. The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, assignee of Thomas Baker Heustis, Bristol, Rhode Island, U. S. A.

267,523 Sole cutter. The Wellman Co., Medford, assignee of Peter Joseph McGowan, Hyde Park, both in Massachusetts, U. S. A.

267,924 Tire mold. The Lambert Tire & Rubber Co., assignee of Frederick A. Krusemark, both of Akron, Ohio, U. S. A.

268,112 Tire trimmer. The Goodyear Tire & Rubber Co., assignee of Vladimir Victor Messer, both of Douglaston, New York, U. S. A.

268,114 Band shaping device. The Goodyear Tire & Rubber Co., assignee of Ray P. Dinsmore, both of Akron, Ohio, U. S. A.

268,136 Curing cabinet. The Nestler Rubber Fusing Co., assignee of Emil Nestler, both of New York, N. Y., U. S. A.

United Kingdom

261,306 Wrapping machine. G. Duvoisin and O. Thiry, 17 Rue de Lancry, Paris, France.

261,579 Apparatus for inflating tires. J. C. Woodford, 505 Third avenue, Oskaloosa, Iowa, U. S. A.

261,885 Fitting for mixing mill, calender, warmer, etc. H. Holt, of E. Kempster & Sons, Ltd., George street, Bury.

262,203 Tire vulcanizer. M. Lamer, 27, Wycliffe Road, E. F. Meakins, 13, Adnitt Road, and C. J. Farr, 27, Wycliffe Road, all in Northampton.

Designs

Germany

974,677 Rubber heel mold. Fritz Rothley, Hohenzollernstrasse 56, Munich.

Udylite

Udylite is the trade name designating the process of the electrolytic application of cadmium to such metals as iron and steel. Cadmium is the most resistant metal to corrosion. It may be ball burnished, scratch brushed or given many other finishes such as nickel, copper or bronze. The Udylite process has endless applications and in rubber goods manufacturing is used for plating inner tube mandrels and expensive molds.—New Haven Sherardizing Co., Hartford, Connecticut.

Editor's Book Table

Reviews

"CHEMICAL ENGINEERING ECONOMIES." By Chapin Tyler, assistant editor, Chemical & Metallurgical Engineering, McGraw-Hill Book Co., Inc., New York, N. Y., 1926. Cloth, 271 pages, 5¾ by 9 inches, indexed, diagrams and graphs.

The author discusses, in thorough and comprehensive manner, the economic principles controlling the organization for plant, production and sales essential to successful development of the chemical engineering projects of which rubber manufacturing is a type. It is a guide for executives and organizers of manufacturing companies in the application of modern methods of team work in industry. It naturally includes the principles of cost accounting and management, operation and control. Each of the ten chapters is supplemented by a concise bibliography on the topics treated which greatly enhances the value of the book.

"SYNTHETIC RUBBER." By S. P. Schotz, Van Nostrand Co., 8 Warren street, New York, N. Y., 1926. Cloth, 144 pages, 7 by 9¾ inches, indexed, illustrated.

The author prefaces his book with the belief that "synthetic rubber will inevitably become one of the most important branches of industrial organic chemistry." He develops this thesis very interestingly in the space of eight chapters in which he discusses pyrogenetic, catalytic and other processes; polymerization, vulcanization and stabilization of synthetic rubber and comparison of the properties and constitution of natural and synthetic rubber. The history of synthetic rubber in Great Britain and Germany is given. The author concludes that all possible demands for synthetic rubber should be met from bituminous coal and American petroleum. Whether synthetic rubber ever becomes commercial or not its history and prospective success are fascinating as recounted in this book.

"BIENNIAL CENSUS OF MANUFACTURES, 1923." Compiled by the Bureau of the Census, W. M. Steuart, director, Washington, D. C. Published by the Government Printing Office. Cloth, 1,454 pages, 6 by 9 inches.

This volume represents the report of the second biennial census of manufactures of the United States, prepared during 1924 but covering operations during the calendar year 1923. In arranging the data concerning the various industrial groups, the compilers have for the first time classified rubber products among the sixteen leading industries, about seventeen pages being devoted to a review of American rubber manufactures.

"MANUAL OF BUFFALO RECLAIMS." By Louis J. Plumb, 1927. U. S. Rubber Reclaiming Co., Inc., 100 East 42d street, New York, N. Y. Paper, 32 pages, 5 by 7½ inches. Indexed. Tables.

This manual is the first of its kind to appear in the rubber industry. The author was for many years the chief chemist of the reclaiming company of which he is now the executive head. The introduction is a brief historical sketch of the U. S. Rubber Reclaiming Co. followed by a systematic description of 18 standard reclaims, their scrap sources, physical properties and uses. The information imparted will enable any rubber chemist or compounder to make the most advantageous selections of reclaims for the work in hand whether mixing for high grade or cheap lines of products. The compounder will also find very helpful the table of volume costs and the specific gravity calculator. The latter covers the full range of reclaims and ingredients used in current rubber compounding practice. The booklet also contains two duplicate forms which have been evolved in practice and will be valuable to the compounder for recording compounds. The manual is issued for free distribution.

"MANUAL OF ACCOUNTS AND BUDGETARY CONTROL FOR THE RUBBER INDUSTRY." By the Accounting Committee of the Rubber Association of America, Inc. Published by The Ronald Press Co., New York, N. Y. Cloth, 257 pages, with index, 6 by 9 inches.

Realizing that there are many inconsistencies in the methods used by manufacturing companies in ascertaining the cost of their sales, and that there is a need for a uniform plan of general ledger accounts, the Rubber Association, through one of its committees, is recommending in the volume under consideration certain methods of procedure which seem both practical and economical.

Parts I, II and III have been devoted to presenting a manual of accounts, which provides proper classifications for the analysis of commercial costs and their connection with general ledger control accounts. Part IV pertains to the collection of commercial costs and their application to products, while Part V outlines a detailed plan of budgetary control, based on the best experience in the rubber industry. It is believed that the manufacturer will find this publication meeting some of his needs and helping him in the solution of some of his accounting problems.

"BIBLIOGRAPHY ON RUBBER TECHNOLOGY 1924-JUNE-1926." Compiled for the Technology Group of the Special Libraries Association, 1926. Seven Sections, paper, 8½ by 11 inches, upwards of 100 pages typed.

This accurate and timely compilation of rubber technology is the first of its kind. It will prove of great interest and value to research chemists and rubber laboratories.

The seven sections cover developments during 1924, 1925 and the first half of 1926 as follows: Section 1, Latex and Raw Rubber, in Process, compiled by Elizabeth Wray, librarian U. S. Rubber Co.; Section 2, Compounding Ingredients, including Organic Accelerators; Section 3, Physics of Rubber, including Physical and Mechanical Testing; Section 4, Chemistry of Rubber, including Chemical Analysis, all compiled by Edith L. Shearer, librarian, Western Union Telegraph Co.; Section 5, Manufacturing Methods and Devices, compiled by Josephine A. Cushman, librarian, Bierce Library, Municipal University of Akron, Ohio; Section 6, Synthetic Rubber and Rubber Substitutes, compiled by Julian F. Smith, technical librarian, The B. F. Goodrich Co.; Section 7, Reclaiming Rubber, compiled by Rose L. Vormelker, librarian, White Motor Co.

Complete set or separate sections may be obtained from Edith L. Shearer, Room 2208, 195 Broadway, New York, N. Y.

"A SURVEY OF AMERICAN CHEMISTRY," Volume I, July 1, 1925, to July 1, 1926. Including Reports from Scientific Committees, Division of Chemistry and Chemical Technology, National Research Council. Edited by William J. Hale, Chairman of the Division, in cooperation with Clarence J. West, Chairman, Committee on Publications and Publicity National Research Council. Published for National Research Council by The Chemical Catalog Co., Inc., 419 Fourth avenue, New York, N. Y. Cloth, 5 by 8 inches, 257 pages.

The progress of chemical research in thirty-four distinct lines of technology is summarized in this volume by an expert in each. William C. Geer in the chapter on rubber reviews recent research work on the fundamental properties of the rubber hydrocarbon, while other chapters include status of synthetic rubber; physical structure of crude dry rubber; electrolytic deposition of rubber; accelerators; electrical properties of raw rubber; vulcanized rubber and gutta percha; absorption of water by rubber; distribution and action of dry powders in rubber; accelerated aging tests; and the value of reclaim to the industry.

Dr. Geer appends to his chapter a list of eleven rubber problems the study of which is needed.

IN COMMERCE REPORTS IT IS STATED THAT SHIPMENTS FROM Soviet Russia of rubber shoes totaled during the fiscal year ended September 30, 1926, 237 metric tons, value 827,000 gold rubles. The gold ruble has a value of $0.5146.

Abstracts of Recent Articles

LINING TANK WAGONS WITH EBONITE FOR ACID TRANSPORT. Compounding and testing ebonite composition, union with metal, vulcanizing methods.—Anonymous, *I. R. J.*, Jan. 15, 1927, pp. 103-105.

LATHE WORK WITH SOFT RUBBER. Practical account.—Anonymous, *I. R. J.*, Jan. 22, 1927, pp. 145-147.

DATA ON SPECIFIC GRAVITIES OF CHEMICALS AND MATERIALS USED IN RUBBER COMPOUNDING OR OF GENERAL INTEREST IN CONNECTION THEREWITH. Tabulation.—*I. R. J.*, Jan. 29, 1927, p. 178, Feb. 5, p. 220. Serial.

ESTATE PRACTISE IN THE COLLECTION AND CURING OF PLANTATION RUBBER.—F. W. G. Rippon, *I. R. J.*, Jan. 29, 1927, pp. 185-186.

CONCENTRATED LATEX AND ITS INDUSTRIAL USES.—Ernst A. Hauser, *I. R. J.*, Jan. 29, 1927, p. 186.

THE SPRAY METHOD OF PREPARING LATEX.—E. Hopkinson, *I. R. J.*, Jan. 29, 1927, pp. 186-187.

NEW METHODS AND MODIFICATION OF RUBBER PREPARATION.—H. P. Stevens, *I. R. J.*, Jan. 29, 1927, p. 187.

THIRTY-THREE THOUSAND VOLT CABLES WITH METAL SHEATHED CORES.—P. Dunsheath, *I. R. J.*, Jan. 29, 1927, pp. 191-192.

CEMENTS FOR RUBBER FLOORING AND TILES.—Anonymous, *I. R. J.*, Feb. 5, 1927, p. 223.

IMPROVEMENT OF STOCK BY THE PROPAGATION OF HIGH YIELD TREES.—R. A. Taylor, *I. R. J.*, Feb. 5, 1927, p. 234.

DEVELOPMENT OF METHODS OF OBTAINING AREAS OF INCREASED PRODUCTIVITY.—J. Grantham, *I. R. J.*, Feb. 5, 1927, pp. 234-235.

BRAZILIAN RUBBER PROSPECTS.—H De Vasconcellos, *I. R. J.*, Feb. 5. 1927, p. 235.

CAOUTCHOUC AS DIELECTRAL MATERIAL.—St. Reiner, *G. Z.*, Jan. 21, 1927, p. 929.

THE STRUCTURE OF RUBBER.—J. Behre, *Kauts.*, 1926, p. 278.

THE CHEMISTRY OF CAOUTCHOUC.—H. Staudinger, *Kauts.*, Feb. 1927, pp. 63-67.

THE CHARACTERISTICS AND TESTING OF RECLAIMED RUBBER.—Paul Alexander, *Kauts*, Feb., 1927, pp. 67-70.

ELUTRIATION ANALYSIS OF FILLERS.—Fritz Evers, *Kauts.*, Feb. 1927, pp. 70-77.

RECOVERY OF VOLATILE MATERIALS IN THE RUBBER INDUSTRY.—George Weisenberger, *Kauts*, Feb. 1927, pp. 82-84. Serial.

THE ACTION OF ACCELERATORS ON EACH OTHER AND ON DIFFERENT COMPOUNDING INGREDIENTS.—Rudolf Ditmar, *G. Z.*, Jan. 28, 1927, pp. 992-994, Feb. 4, 1927, pp. 1048-1050.

ARTIFICIAL LEATHER.—Materials and methods of manufacture of artificial leather from leather scrap, from cellulose derivatives and from rubber.—M. De Wilmet, *R. G. des M. P.*, Nov. 1926, p. 691.

APPLICATION OF X-RAYS IN THE TEXTILE INDUSTRY.—George L. Clark, Dept. Chem. Eng., M. I. T., Serial No. 183, Dec. 1926. Reprinted from *Am. Dye Rep.*

ROUTINE PRACTISE IN THE RUBBER LABORATORY.—P. Zilchert, *G. Z.*, Oct. 22, 1926, pp. 190-191.

SYNTHETIC RUBBER. A review.—Richard Weil, *Ind. & Eng. Chem.*, Nov., 1926, pp. 1174-77.

ELECTRIC MEASUREMENT OF TEMPERATURES IN VULCANIZERS.—Walter Jaekel, *Kauts.*, Sept., 1926, pp. 214-216.

MAGNESIA USTA AS A REINFORCING AGENT IN RUBBER MIXTURES.—Werner Esch., *G. Z.*, Nov. 5, 1926, pp. 309-10.

RETARDING RUBBER DETERIORATION. A complete survey of all old and recent patents for improving aging properties of rubber goods.—Francis B. Leech, *R. A.* (N. Y.), Feb. 10, 1926, p. 451.

SAMPLES PREPARED WITH PARANITROPHENOL. Samples were tested, and results confirm the claim that paranitrophenol should tend to produce rubber with a more uniform rate of cure as it prevents variation due to maturation.—H. P. Stevens, *B. R. G. A.*, Jan. 1927, pp. 45-47.

THE REVERTEX PROCESS.—Ernst A. Hauser, *Kauts.*, Jan., 1927, pp. 2-16.

X-RAY STUDIES ON RUBBER AND SIMILAR SUBSTANCES.—E. A. Hauser and P. Rosebaud, *Kauts.*, Jan., 1927, pp. 17-21.

RECOVERY OF VAPORS FROM AIR AND GAS.—St. Reiner, *Kauts.*, Jan., 1927, pp. 33-34. Illustrations. Serial.

THE MELTING LINE OF STRETCHED RUBBER AND ITS RELATION TO DENSITY. The law of the elastic condition. A contribution to the thermodynamic and structure research of rubber.—Dr. Heinrich Feuchter, *Kauts.*, Jan., 1927, pp. 23-28.

THE ACTION OF ULTRAVIOLET LIGHT ON RUBBER SOLUTIONS IN PRESENCE OF YELLOW PHOSPHORUS. A contribution to the vulcanization problem.—F. Kirchhof, *Kauts.*, Jan., 1927, pp. 28-30. Tables.

RESULTS OF A TAPPING EXPERIMENT ON PONDOK GEDEH ESTATES.—P. M. H. H. Prillwitz, *Archief*, Dec., 1926, pp. 577-601. Tables, graphs, English summary.

THE ECONOMY OF SODIUM. Silico fluoride as a coagulant.—N. H. Van Harpen, *Archief*, Dec., 1926, pp. 602-615. Tables, graph. English version, pp. 616-629.

EXPERIMENTAL TAPPING ON HEVEA SEEDLINGS AND BUDDING ON TJINTA RADJA ESTATE.—Dr. C. Heusser, *Archief*, Dec. 1926, pp. 630-636. Tables, graph, English version, pp. 637-640.

New Trade Publications

"LABORATORY APPARATUS AND REAGENTS FOR CHEMICAL, METALlurgical and Biological Laboratories," a copiously illustrated catalog of 627 pages, is issued by Fisher Scientific Co., Pittsburgh, Pennsylvania, formerly Scientific Materials Co. The volume is fully indexed and complete in every respect. Its special features were adapted to meet the needs of laboratories seeking preferred apparatus. The goods listed conform to the standardization requirements of the American Chemical Society: American Society for Testing Materials, and American Bacteriological Society.

"YARWAY BLOW-OFF VALVES." THIS FOUR PAGE ILLUSTRATED bulletin issued by Yarnall-Waring Co., Chestnut Hill, Philadelphia, Pennsylvania, describes the new Yarway Type C seatless valve in all its forms.

"PUBLIC SAFETY" IS THE TITLE OF A NEW MONTHLY BULLETIN being issued by the National Safety Council, Chicago, Illinois.

"BELMONT PACKINGS FOR STEAM, AIR, AMMONIA, HYDRAULICS, Oils, Gases, Acids, etc." A well-illustrated catalog issued by the Belmont Packing & Rubber Co., Philadelphia, Pennsylvania.

DIE DEUTSCHE KAUTSCHUK-INDUSTRIE IS A SPECIAL NUMBER of the *Gummi-Zeitung*, Berlin, published on the occasion of the Seventh International Rubber Exposition in Paris. Its 200 pages, enriched with numerous pictures of leading German rubber men and views from the German rubber goods and machinery works, give a complete resumé to the rubber industry in Germany: its importance in the German economic system, Germany's part in rubber research, etc. The scope and value of the paper is increased by the fact that it is printed in four languages: German, French, English and Spanish.

"DAILY RUBBER TRADE," NEW YORK, N. Y. HAS DEVOTED ITS issue for February 11, 1927, to commemorating the anniversary of the establishment of the New York Rubber Exchange, the leading article, reviewing the activities of that organization during the past year, having been prepared by its president, F. R. Henderson. Other articles of importance to the industry also appear in this special issue.

CEYLON STANDARD PRODUCTION

It has officially been announced that standard production for Ceylon for the fifth restriction year has been fixed at 73,839 tons.

CRUDE RUBBER REEXPORTS FROM THE UNITED STATES DURING THE year 1926 totaled, according to the Department of Commerce, 39,583,454 pounds, value $22,470,583. The figures are said, however, to be preliminary and may later be corrected. By far the largest of the above-mentioned shipments went to Canada, a total for the year of 38,895,905 pounds, value $22,175,712.

New Goods and Specialties

Rubber Covered Manikin

An unusual and extremely attractive manikin has been adopted by many leading manufacturers and department stores to display delicate and dainty lingerie and bathing models. The instant appeal to popular fancy of these figures has inspired their creator, Mrs. Phebe Rae Whitney, 34 East 22nd street, New York, N. Y., to make many additions to the original line so that they may now be procured in fitting postures to show off to advantage the latest styles in coats, dresses, etc.

Bathing Girl

Each manikin is specially designed, the pose selected which will best suit the particular type of dress to be exhibited. Mrs. Whitney first draws the outline of the figure and the model is then cut from the outline. The limbs are cut in separate sections, and one arm is detachable, thus facilitating the putting on and taking off of the costume. The figure is then padded and the whole covered with a thin sheet of rubber colored to a delicate flesh tone. The face is featured in appropriate colors and a wig or transformation further transforms the model into a perfect representation of a living manikin. The feet may be encased in shoes or sandals, and the finger tips given a darker pink stain like the nails of a highly polished manicured hand. The general effect is of the poster variety, but since these figures are not a part of the background, they stand out from the picture making the costume the prominent part of the display. When the manikins become soiled, they are easily restored to freshness with a sponge and a little soap and warm water, ready for another appearance in a smart Parisian frock.

For infants' wear the baby figures are adorable with their curly little blond wigs, and their pink little legs and feet curled up in the act of crawling.

Mission Dispenser

Rubber Orange for Serving Juice

A device for dispensing orange juice employs a rubber bulb made in a two part mold, and having the shape, rind markings, and color of a large orange, the pigment being added in compounding. The bulb, which is ribbed longitudinally within to enhance quick return to shape after deformation in squeezing, is snapped over a metal cap fitting over a glass jar in which is set an L-shaped nickel tube. Compression of the rubber orange forces the juice up through the tube and out into a drinking glass, operating somewhat like a seltzer syphon. Manufactured by the Eno Rubber Corporation, Torrance, California, for the California Crushed Fruit Corporation, 1601 East 16th street, Los Angeles, California, proving a good advertisement for the company, as well as a handy device.

In keeping with rainy day styles the department stores are displaying "Puddle" boots. These high boots are useful and stylish additions to the novelty footwear so much the vogue.

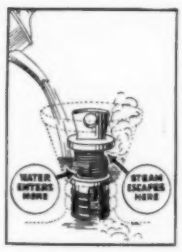
Windshield Wiper

The Dyneto electric windshield wiper operates from storage battery, using less than one ampere, and the manufacturer claims it will outwear an automobile. It is small, compact and will not rust. With a tandem attachment it increases safety, giving double vision, and has ample power to drive two blades in the heaviest snowstorm. It runs evenly regardless of the speed of the engine, working as well on hills as on the level. Lubrication is provided by wick oil feed for two years of constant service. Gears are cut, not stamped, insuring accuracy, free running, silence. Wiper arm has simple adjustment for tension, the blade is of light, flexible rubber and drags across glass with a clean stroke.—The Owen-Dyneto Corporation, Syracuse, New York.

Dyneto Wiper

Anti-Scald Hot Water Bag

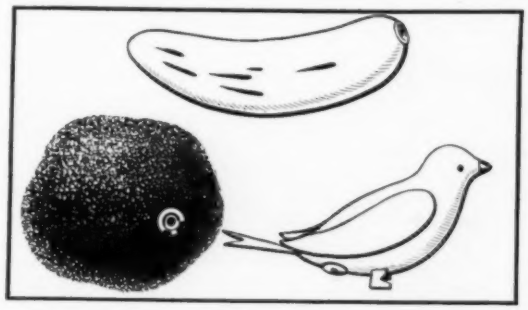
This new hot water bag is the invention of a doctor who, after treating many scald cases, developed a stopper with special vents for the inlet of water and the outlet of escaping steam and air, tending to eliminate the risk of such accidents made possible through bubbling and splashing of the water. The bag is made of the highest quality of rubber and cannot leak. The stopper does not come out and therefore cannot be lost, a common annoyance in hospitals as well as homes. An interesting feature of the stopper is that, owing to its two-start thread, it screws in with two turns less than the usual stopper. The bag is made in 8 by 10 inch, 8 by 12 inch and 12 by 10 inch sizes.—Charles Macintosh & Co., Ltd., 22-23 Jewin street, E. C. 1, London, England.



Safety Stopper

Toy Whistles

An assortment of whistles in the form of bananas, doughnuts, canary birds, and other familiar objects, has met with instant success according to the manufacturer, "Vulkan" Gummiwarenfabrik Weiss & Baessler A-G, Berlin W. 35, Germany. The whistles are made from calendered sheet rubber, in a two part mold, the wings and feet of the bird afterward cemented on.

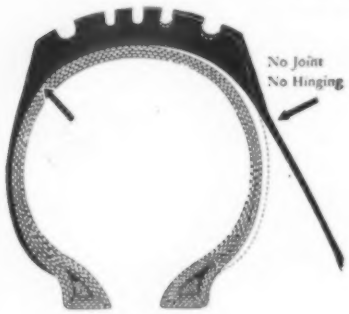


German Whistles

The doughnut is colored the shade of a luscious German doughnut and heavily coated with coarse granulated sugar; the bananas and birds are a canary yellow and featured in black.

New Balloon Tire Construction

Scientifically correct is how Miller officials describe a new type of balloon tire, with semi-flat tread design, which they have just announced. It has tread and sidewalls made in one piece, eliminating seams and joints, the trouble points of the past. This makes a smooth, flexible, wear resisting surface, capable of greatly increased mileage, it is claimed. The company has spent approximately $2,000,000 perfecting this tire, which is designed to overcome the difficult problems of balloon tire construction such as, internal heating, tread and sidewall separation, spotty wear conditions, known to all motorists. This latest development, actual service has shown, stops sidewall and tread separation, hinging at the joints, and gives long time protection to the whole tire.—The Miller Rubber Co., Akron, Ohio.



Semi-Flat Tread Design

Golf Ball Cleaner

This new golf ball cleaner is lined throughout with sponge rubber that does not get foul and slimy and does not wear or disintegrate like ordinary sponge or wash leather. It is only necessary, after use, to rinse the cleaner in water to restore it to perfect cleanliness, the device retaining the moisture for a long time.—Sorbo Rubber-Sponge Products, Ltd., Woking, Surrey, England.

Sorbo Cleaner

Sponge Rubber Stamp Gum

A sponge rubber gum which is firm, yet elastic, resilient and springy is made by the Atlantic Rubber Manufacturing Corporation, 239 Fourth avenue, New York, N. Y. It is made from Para rubber, and has a rebound, under pressure, that is only possible in gums made of high grade rubber compounds.

Extension Tire Ring

A unique device for prevention of damage, trouble and loss of time in case of puncture or burst. The extension tire ring is simply a solid rubber ring mounted on a special rim which, being fixed to the wheel, automatically comes into operation when the pneumatic tire is deflated, taking upon itself the whole weight of the axle. It is always in service and is easily attached to the inner side of the wheel by means of the slightly longer rim bolts with which it is provided, does not interfere in any way with the design of the wheel, and dispenses with the need of carrying a spare. It is attached by taking off the wheel, removing the rim bolts, laying the extension ring on the inner side of rim and fixing with bolts through existing holes.—The Avon India Rubber Co., Ltd., 343-5 Euston Road, London, N. W. 1, England.

Automobile Tire

Record Golf Ball

The claim made for this new golf ball is that it combines both distance and durability, actual tests proving that it will average within five yards of the longest ball made and is one of the most durable on the market. This is something new in the manufacture of golf balls. It means that the Record ball is so fashioned that it provides practical indestructibility without sacrificing any of its distance qualities. The ball will not cut nor nick, according to the manufacturer's guarantee.—A. J. Reach, Wright & Ditson, Inc., Philadelphia, Pennsylvania.

Flat Belt

New Rubber Fan Belt

The HiLab Products Co., division of Hide Leather & Belting Co., Indianapolis, Indiana, makers of leather fan belts and belting since 1870, has announced the addition of a rubber fan belt line. This line will be sold under the brand name of HiLab also, thus giving the company, so it claims, the most complete line of fan belts in the world. The illustrations show the V and flat type.

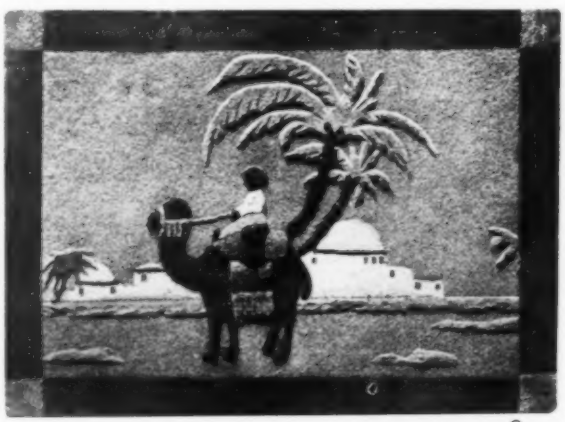
V Belt

Triplexd Gasoline Hose

This hose is so named because of its triple construction. The flexible metal lining is first subjected to a breakdown pressure beyond anything it will receive in actual service, next a rubber compound is laid over this lining so as to maintain an equal thickness throughout without a seam, and over this is woven a tough oversize cotton cord, the whole vulcanized into a leakless, lasting, inseparable unit. Repairs are made free as long as repairs are possible, regardless of how long the hose is in service.—Metal Hose & Tubing Co., Brooklyn, New York.

Sponge Rubber Bathroom Mats

Among the many novelties recently displayed, sponge rubber bathroom mats deserve special mention because of the artistic designs and beautiful, colorful appearance of these articles. The illustration shows only one of the endless range of models, which are manufactured also in appliqué flower designs, inlaid and tile


Colored Bath Mat

mats. Besides being a fine and decorative ornament for the bathroom, the mat is also practical and hygienic, easily cleaned when soiled. The preferred sizes are about 20 by 28 inches and 24 by 36 inches.—Belinde Werke Aktiengesellschaft, Hamburg-Wandsbek, Germany.

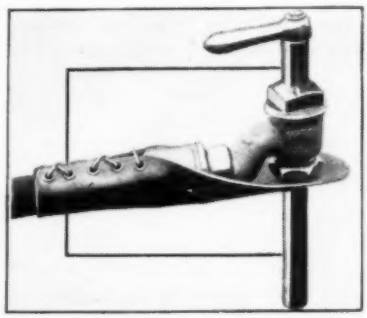
Tooth Exerciser

Biting and pressing on this rubber exerciser for about a half minute morning and night will strengthen the teeth and gums, and improve almost immediately an empyemia condition of the mouth, is the claim of the inventor, Edwin J. Ross, 1416 Broadway, New York, N. Y. The exerciser is a special plate-like device made of soft but tough rubber which is almost indestructible, fits the mouth perfectly, and is easy to keep clean. It should be washed with hot or cold water before and after using. To use, place the exerciser in the mouth and bite with every tooth. An excellent exercise is to pull on the little tongue of the device, resisting with the teeth, turning the head from side to side. In bad cases of pyorrhea, the exerciser may be used for a minute or more at a time, four or five times a day. To relieve toothache, bite on the device at intervals, lightly at first, then more firmly, until the pain gradually decreases.—Natural Health Association, Inc., 152 West 42d street, New York, N. Y.

Ross Exerciser

Protector for Petrol Pump Nozzles

Owners of sleek, glossy cars have frequently complained of dents and scratches caused by the garage man, in his eagerness to be quick and obliging, bumping the filler nozzle of the pump hose into the tank. To obviate this annoyance, the M & B protector was designed as a permanent protective device for the petrol pump. It is made of sheet rubber, shaped to fit over the nozzle and around the hose pipe in the form of a gaiter, fixed in place by means of a leather lace threaded through eyelets. The main object is to form a soft cushion between the metal parts of the nozzle and the paintwork of the car. However, it also performs another duty as the extended flap covers the filling aperture, preventing rain, etc., from entering the tank during the process of filling.—Moss & Ball, 345 Woodbridge Road, Ipswich, England.



M & B Protector

Golf Practice Ball

These balls illustrate the wonderful resilient properties of Onazote, a rubber compound expanded by gas into a highly cellular form giving great strength and toughness. The ball weighs one-fourth ounce, is capable of supporting, without bursting, the weight of a man, and will recover its original shape after release of pressure. Its introduction into Great Britain has met with huge success and preparations are in hand for the manufacture of vast quantities to supply the demand.—Expanded Rubber Co., Ltd., 38 Harlesden road, Willesden Green, London, N. W. 10, England.

Pneumatic Golf Ball

The claim made for this ball is that the golfer can consistently further his drive 30 yards because of the compressed air center. The lead core in the center of the rubber spider gives a central point of balance and weight. The spider in the hollow center of the rubber shell, being surrounded by air, is also maintained in perfect balance. The spider has 14 rubber legs, each leg touching the side of the containing shell, but when the club hits the face of the ball, or the ball hits the ground, the weight of the lead core is forced by the impact against the side of the shell, giving the outside mesh cover greater friction with the striking surface, and consequently better control of the ball.

The spider is sealed in the shell, the two halves fitted together and inflated. When inflated the shell becomes larger, the winding rubber tape reducing it to its original size and compressing the air within to 300 pounds pressure, giving great resiliency. The compressed air is retained for an indefinite period as a secret process prevents absorption or leakage. The paint is impregnated into the cover so that it does not peel off, chip or wear.—Chatfield Co., Inc., 100 Amity street, Flushing, New York. Distributers, Harry C. Lee & Co., Inc., 10 Warren street, New York, N. Y.

Windshield Wiper Blade

This new wiper blade fits any style windshield wiper—just take out the old blade and insert the Christen blade. It is rust proof and keeps windshield clear without continuous wiping, the rubber wipes off the dust and the felt puts on a chemical which keeps the vision area of windshield clear for several hours.—V. H. Christen Manufacturing Co., 319 Orleans street, Detroit, Michigan.

New Balloon Tire

The new All Weather balloon tire, announced shortly after January 1 by the Goodyear Tire & Rubber Co., Akron, Ohio, and now on the market, represents the successful result of more than two years' experimental and development work directed to the design of a scientific tread for balloon tires.

All Weather Tire

The major characteristics of the new product include two heavy shoulder service ribs and sharply cut tread buttons of special size, so placed as to give superior tractive qualities, highly developed resistance to skidding under all road conditions, and slow, even tread wear throughout the life of the tire.

The latest type balloon tire was developed after 80 different treads had been produced and tested for thousands of miles on test fleets.

Radiator Hose

The L. H. Gilmer Co., Philadelphia, Pennsylvania, has announced the production of a new radiator hose. It is claimed that the hose is so constructed that it shows remarkable resistance to the action of hot and cold water, as well as oil and anti-freeze solutions. The hose has a tough rubber lining and is reinforced with three plies of woven fabric. It is marked off in inches to facilitate cutting and is made in standard sizes from ¾ to 3 inches.

Obituary

Treasurer Boston Woven Hose & Rubber Co.

With deep sorrow, the Boston Woven Hose & Rubber Co., Boston, Massachusetts, announces the death on February 16, 1927, of George H. Burgess, the honored treasurer of the company.

Mr. Burgess was born November 28, 1867, at Dighton, Massachusetts. Shortly after the family moved to Portland, Maine, where he attended school and after graduating he went to work for the Traveler's Insurance Co. About 1890, Mr. Burgess moved to Boston and became associated with Frank B. Bennett, publisher of the *American Wool & Cotton Reporter* and *United States Investor*.

In 1897, he joined the Boston Woven Hose & Rubber Co., and following the reorganization of the company two years later became assistant treasurer, a position which he held until 1917 when following the retirement, as treasurer, of H. B. Sprague, Mr. Burgess succeeded to the position on May 22, 1922, becoming at the same time one of the company's directors.

The death of Mr. Burgess was entirely unexpected, as he enjoyed his usual good health up to within two days of his death He leaves a wide circle of business and personal friends to whom his sterling qualities and sound business judgment greatly endeared him.

Mr. Burgess was unmarried and leaves two sisters and two brothers.

Vice President of The Clyde E. Lowe Co.

The many friends of Edwin G. Geering were shocked and grieved to learn of his sudden death at Akron on January 24, 1927. For the past four years he had been vice president and salesman of The Clyde E. Lowe Co., 2976 East 81st street, Cleveland, Ohio, manufacturer of circular mandrels.

Mr. Geering, who was born fifty-five years ago in Cleveland, Ohio, began his business career at the age of twenty-six, when he became associated as a salesman with Canby, Ach & Canby of Dayton, remaining with that organization for twenty-five years and going from there to the Lowe company. Possessing a likable personality, Mr. Geering through his sincerity and genial manner made many friends in the rubber industry, where his passing is deeply regretted.

He was a member of Lakewood Lodge 601 F. and A. M., and the High Noon Club of Cleveland, and was also past grand counsellor for the Ohio jurisdiction of the United Commercial Travelers. He is survived by his widow and two sisters, Mrs. Nellie G. Hanson and Miss Mary Geering, all three residing in Cleveland.

A Veteran Rubber Man

Clarence Herbert Guild, for many years an official with the former Banigan rubber interests at Woonsocket, Rhode Island, later with the Woonsocket Rubber Co., and the United States Rubber Co.; and father of Clarence H. Guild, Jr., now with the United States Rubber Co. at New York, died suddenly at his home in Providence on February 19 in his 81st year.

Mr. Guild was born at Dedham, Massachusetts, on September 7, 1846, and received a common school education in his native town. He came to Providence when 20 years of age and entered the employ of the A. & W. Sprague Manufacturing Co., cotton good manufacturers, and remained with that concern until after its failure in the early seventies. He became affiliated with the rubber industry by employment with the Banigan Rubber Co., and later with the Woonsocket Rubber Co., for many years being the secretary treasurer of the latter. He held this office when the Banigan, Woonsocket, and Marvel rubber companies, with others, became consolidated as the United States Rubber Co., continuing in office at the Woonsocket plant until his retirement about five years ago. Mr. Guild was affiliated with the Masonic fraternity and was an active member of the First Baptist Church. He is survived by three sons, Frederick T. Guild, registrar at Brown University; Joseph L. Guild and Clarence H. Guild, Jr., with the United States Rubber Co. at New York; and one daughter, Mrs. Fletcher W. Paft of Lexington, Massachusetts.

Superintendent Vulcanized Rubber Co.

Oscar F. Beck, superintendent of the Vulcanized Rubber Co., Morrisville, Pennsylvania, died at his home, 438 Washington street, Morrisville, on February 13 following a long illness. Mr. Beck was born in Tamaqua, Pennsylvania, and forty-three years ago entered the employ of the Vulcanized Rubber Co. He worked at various positions and some years ago was made superintendent of the plant. He was a member of several fraternal organizations. The deceased is survived only by his widow. The interment was in the Morrisville Cemetery.

Former Secretary of Mercer Rubber Co.

John Everts Clancy, former secretary of the Mercer Rubber Co., Hamilton Square, New Jersey, died suddenly February 5 in his apartment at the Waldorf-Astoria, New York City, where for the past thirty years he had made his winter residence. He was eighty-five years of age, but up to the time of his death had been apparently in excellent health.

Mr. Clancy was a graduate of Union College, Schenectady, and a member of Phi Beta Kappa. At an early age he became interested in manufacturing, and was for a number of years associated with the Mercer organization, which specialized in the manufacture of mechanical rubber goods. In 1910, he resigned his duties as secretary, although remaining one of the company's directors. The deceased was formerly a member of the old Lotus and Lochiel Clubs of Trenton. He is survived by his widow.

Assistant Treasurer of New Jersey Zinc Co.

On February 1 William G. Sutphen, assistant treasurer of the New Jersey Zinc Co., 160 Front street, New York, N. Y., died at his home in Verona, New Jersey, after an illness of several weeks. He was fifty-five years old. Aside from his connections with The New Jersey Zinc Co., Mr. Sutphen had held other positions of responsibility, being at one time mayor of Bloomfield, New Jersey, and also a director of the Bloomfield Trust Co. and the Sussex County Trust Co. He is survived by his widow and two sons.

WORLD'S TIRE EXPORTS

Total shipments of automobile tires from the various manufacturing countries have represented an average increase since 1922, according to the Department of Commerce, of nearly a million casings a year. There are indications, however, that the year 1926 has shown no increase in exports, and possibly a slight decline. France continues to hold the lead as the largest exporter of tires, the figure rising from 1,210,000 casings in 1922 to 1,872,000 for 1925, the corresponding totals for the United States being 1,326,000 and 1,770,000. During the first eleven months of 1926 France exported approximately 1,709,000 tires, while in the same period the total for the United States was 1,486,000.

Financial and Corporate News

The B. F. Goodrich Co.

NET SALES of The B. F. Goodrich Co., Akron, Ohio, for the fiscal year ended December 31, 1926, were in excess of $148,000,000. The profits from operations for that period were approximately $10,500,000 and after deducting ample depreciation on properties, interest on borrowed money and provision for federal income taxes were a little in excess of $5,000,000. Current assets on December 31, 1926, were approximately $62,900,000 and the current liabilities approximately $6,800,000. Of the $15,000,000, 5 per cent notes issued one year ago $5,000,000 were due on January 15, 1927, and paid from current assets.

At a meeting of the Board of Directors held on January 26, 1927, dividends on the preferred stock were declared as follows: $1.75 per share, payable April 1, 1927, to stock of record March 15, 1927, and $1.75 per share payable July 1, 1927, to stock of record June 15, 1927. The directors also declared a dividend of $1.00 per share on the common stock payable March 1, 1927, to stock of record February 15, 1927. The directors also approved the retirement of 11,880 shares of preferred stock in accordance with the provisions of the charter.

The Goodyear Tire & Rubber Co.

To the Stockholders: Net sales of the consolidated group of Goodyear companies were $230,161,356 in 1926 compared to $205,999,829 in 1925, an increase of about 12 per cent. Total net profits of your company, credited to surplus in 1926 (after providing $7,494,122 for depreciation of plants and equipment and after charging excess cost of rubber and cotton in net amount of $5,250,000 to the special raw material reserve set up in 1925, and after all taxes, interest and other charges, and after deducting profits of subsidiary companies applicable to stock not held by your company), were $8,799,138.

After payment of dividends amounting to $8,743,444, including 4¾ per cent ($3,090,388) on account of arrears on the preferred stock, the surplus at the close of the year amounted to $30,705,014. The ratio of current assets to current liabilities improved materially during the year, being 9.9 to 1, as shown by the fully consolidated balance sheet. The principal amount of your company's outstanding bonds and debentures was reduced during the year by $5,591,200, through operation of the sinking funds.

During the latter half of 1925 the price of crude rubber rose to abnormally high levels, reaching a peak of $1.20 per pound. By the beginning of 1926 the price had receded to $.90, and by the middle of the year had fallen to its present level of approximately $.40. These violent price fluctuations and consequent frequent adjustment of the selling price of finished product, created serious problems for the rubber industry. The crude rubber requirements of your company alone represent about one-eighth of the world's total production and exceed by nearly 50 per cent those of any other manufacturer.

In the face of such conditions, the net profits for 1926, though less than for 1925, are considered satisfactory. Restrictive export measures in force in certain parts of the rubber growing areas of the Far East are not unlikely to cause a recurrence of shortage of supply and high prices. As a measure of protection for itself and its customers against such recurrence, your company has recently joined with a number of other rubber and automobile manufacturing companies to establish a crude rubber reserve supply.

The company's volume of business in foreign fields continues to grow. After careful study of conditions in Australia, your directors have deemed it to the best interest of the company to establish a tire manufacturing plant in Sydney. It is expected that the new

CONSOLIDATED BALANCE SHEET DECEMBER 31, 1926

ASSETS

Property Accounts		
Land, buildings, machinery and equipment	$63,283,201.69	
Less: Depreciation	17,770,718.50	
		$45,512,483.19
Purchase and development of rubber plantations in Sumatra		6,581,694.02
Equipment, fixtures and furniture at branches and automobiles (at depreciated values)		714,239.42
		$52,808,416.63
Investments in and Advances to Subsidiary Companies and Foreign Branches		
Investment in net capital assets		$25,004,898.75
Investment in net current assets		23,337,788.09
		$48,342,686.84
Investment in company's securities including cash deposited with trustee in anticipation of debenture bond sinking fund requirement		2,759,245.25
Current Assets		
Inventories, at cost or market, whichever is lower		$39,434,600.07
Accounts and notes receivable	$10,889,359.82	
Less: Reserves	1,872,207.38	
		9,017,152.44
Call loans		7,000,000.00
Cash in bank and on hand		6,495,520.04
		$61,947,272.55
Other Assets		
Including special account and securities held therein, goodwill and patents,		
As at December 31, 1925		$12,500,000.00
Less: Partial liquidation thereof		2,180,725.32
		$10,319,274.68
Deferred Charges to Future Operations		
Discount on bonds, debentures and notes, less amount written off		$2,678,897.55
Prepaid insurance and other expenses		109,531.69
		$2,788,429.24
		$178,965,325.19

LIABILITIES

Capital Stock		
Prior preference stock, 8% cumulative		
Authorized—219,045 shares (par value $100 each)	$21,904,500.00	
Issued—150,000 shares		$15,000,000.00
Management stock 6% cumulative		
Authorized and issued—10,000 shares (par value $1 each)		10,000.00
Preferred stock 7% cumulative		
Authorized—1,000,000 shares (par value $100 each)	$100,000,000.00	
Issued—655,326 shares	$65,532,600.00	
Less: Held in treasury	453,000.00	
		65,079,600.00
Note: Dividends accrued 25%.		
Common Stock		
Authorized 1,450,000 shares (no par value)		
Issued—830,734¼ shares (no par value)		1,000,000.00
		$81,089,600.00
Funded Debt		
First Mortgage (closed) 20-year 8% Sinking Fund gold bonds (redeemable at 120% semi-annually)		
Authorized and issued	$30,000,000.00	
Less: Bonds redeemed and cash in hands of trustees	8,250,000.00	
		$21,750,000.00
Ten-year 8% sinking fund gold debenture bonds		
Authorized	$30,000,000.00	
Issued	$27,500,000.00	
Less: Redeemed and cash in hands of trustees	10,272,700.00	
		17,227,300.00
Three-year 5% gold notes		
Authorized and issued		15,000,000.00
		$53,977,300.00
Current Liabilities		
Accounts payable		$5,848,717.03
Accrued interest and premium on bonds and notes		960,404.61
		$6,809,121.64
Reserves		
Reserve for contingencies and federal taxes		$3,884,289.48
Special raw material reserve		2,500,000.00
		$6,384,289.48
Surplus: As per statement attached		30,705,014.07
		$178,965,325.19

Note: Contingent liability
In respect of endorsement $302,144.

plant, now under construction, will be in production before the end of the current year.

Notable improvement in production facilities, through the introduction of latest machinery and equipment and some new plant construction, have been made during the year. The combined capacity of the Akron, California and Canadian plants is now 65,000 tires and 75,000 tubes daily.

An outstanding development of the year was the perfection of a new type of tread for balloon tires, now going on the market. This new tire, exhaustive tests distinctly show, will give better and longer service, and should prove a real factor in enhancing the already pre-eminent position of your company in the tire field.

In a communication to stockholders of October last, I outlined a plan for refunding the senior securities of the company with securities having lower interest rates and lighter sinking funds, and for the elimination of management stock and all voting trusts and full restoration of control to stockholders, to be effected along with some adjustment of the preferred stock dividend accumulation which would be fair to both preferred and common stockholders. Consummation of this plan was blocked because of the unwillingness of the majority of the common stock voting trustees to consider any plan which provides for the termination of the common stock voting trust.

I am still firmly of the conviction that some plan to accomplish these several objects ought to be put into effect while conditions for doing so are favorable. Progress in this direction is also being impeded by pending litigation which has been instituted by certain stockholders and which I believe not to be in the interest of the company and stockholders at large.

P. W. LITCHFIELD,
President.

Dividends Declared

COMPANY	Stock	Rate	Payable	Stock of Record
Boston Woven Hose & Rubber Co.	Com.	$1.50	Mar. 15	Mar. 1
Fisk Rubber Co.	2nd Pfd.	$1.75 q.	Mar. 1	Feb. 15
Goodall Rubber Co.	Com.	$5.00	.....	.....
Goodall Rubber Co.	Com., ex.	$5.00	.....	.....
Goodyear Tire & Rubber Co.	7% Pfd.	$1.75 q.	Apr. 1	Mar. 1
Goodyear Tire & Rubber Co.	8% Pr. Pfd.	$2.00 q.	Apr. 1	Mar. 13
Hood Rubber Co.	Com.	$1.00 q.	Mar. 31	Mar. 21
Miller Rubber Co.	Pfd.	$2.00 q.	Mar. 1	Feb. 10

New York Stock Exchange Quotations

February 23, 1927

	High	Low	Last
Ajax Rubber, com.	11¼	11	11¼
Fisk Rubber, com.	17⅛	16¾	17⅛
Goodrich, B. F., Co., com. (4)	53½	52	52¾
Kelly-Springfield Tire, com.	10⅛	10	10
Kelly-Springfield Tire, pfd.	43	43	43
Keystone Tire & Rubber, com.	⅝	⅝	⅝
Lee Rubber & Tire, com.	7⅛	7⅛	7⅛
Norwalk Tire & Rubber, com.	5⅛	4⅝	5
United States Rubber, com.	63⅜	62½	63
United States Rubber, 1st pfd. (8)	109¾	109½	109½

Akron Rubber Stock Quotations

Quotations of February 19, supplied by Otis & Co., Cleveland, Ohio.

COMPANY	Last Sale	Bid	Asked
Aetna com.	19	18½	19
Aetna pfd.	93	90	95
Falls com.	4⅞	..	4
Falls pfd.	10	..	15
Faultless com.	37¾	37	39
Firestone com.	122	120	125
Firestone 1st pfd.	104½	104	104½
Firestone 2nd pfd.	99⅛	98½	99¼
General com.	150	..	150
General pfd.	102½	102½	110½
Goodrich com.	54½	..	..
Goodrich pfd.	98½	..	..
Goodyear com. V. T. C.	30½	30	30½
Goodyear pfd. V. T. C.	100	..	..
Goodyear pr. pfd. V. T. C.	107	..	..
India com.	29	..	29
Miller com.	34	..	..
Miller pfd.	105	..	105½
Mohawk com.	20	..	..
Mohawk pfd.	74	..	65
Seiberling com.	22½	22	23½
Seiberling pfd.	97	97	..
Star com.	11	..	4
Star pfd.	30	..	..

New Incorporations

THE ALLING-WATERS RUBBER CO., February 4, 1927 (New Jersey), capital $50,000, divided into 500 shares of the par value of $100 each. Incorporators: Clarence E. Alling, Stamford, Connecticut; Jesse Waters, Paterson, New Jersey; and Arthur E. Alling, New Haven, Connecticut. Principal office, 131 Main street, Paterson, New Jersey. To manufacture and deal in rubber goods of all kinds.

BARRETTS CREDIT TIRE SHOPS, INC., February 11, 1927 (New York), capital 100 shares, no par value. Incorporators: Elsie Schlesinger, 291 Broadway; S. Philip Cohen, 1219 Nelson avenue; and M. Howard Leibowitz, 127 Second avenue, all of New York City. Principal office, Manhattan, New York. To deal in tires, etc.

L. BLITZ, INC., February 11, 1927 (New York), capital 100 shares, no par value. Incorporators: Herman S. Becker, 165 West 91st street; and Henry E. Chapin, 27 William street, both of New York City; and Catherine Blitz, New Dorp, Staten Island. Principal office, Manhattan, New York. Rubber and gutta percha.

CONCOURSE TIRE CORP., February 3, 1927 (New York), capital $5,000, par value $50. Incorporators: Samuel Silverman, 2352 University avenue; and Eva Zucker, 1264 Sheridan avenue, both of Bronx, New York, and Gertrude Goldsmith, 1431 Madison avenue, New York City. Principal office, Manhattan, New York. To deal in auto tires, etc.

EDWARDS-BROWN TIRE CO., November 1, 1926 (Mississippi), capital $10,000. Incorporators and officers: Edwin W. Edwards, president; Thomas R. Brown, vice president; and T. L. Blissard, secretary and treasurer. Principal office: Gulfport, Mississippi. To deal in tires and do general automobile repair business.

ENGLISH TIRE CO., INC., January 19, 1927 (New York), capital $20,000. Incorporators: Harold S. Caplan, Dahill Road, Brooklyn, New York; Nathan Tolk, 164 Beach 27th street, Edgemere, Long Island; and Lillian Lederer, 4735 44th street, Woodside, Long Island. Principal office, Brooklyn, New York. To deal in tires, etc.

GOODRICH TIRE SALES, INC., September 13, 1926 (Minnesota), capital $50,000. Incorporators and officers: Roy J. Mordaunt, president; Stanley O'Konek, vice president; and Harry A. Jackson, secretary and treasurer. Principal office, Minneapolis, Minnesota. To deal in tires and all kinds of rubber goods.

INVINCIBLE INNER TUBE CORP., February 9, 1927 (New York), capital $50,000. Incorporators: Allen J. Rheubottom and A. L. Rheubottom, both of 11 Pratt street, Mayville, New York; and Olive L. Wright, 7 Meadow Lane, Jamestown, New York. Principal office, Jamestown, New York. To manufacture inner tubes, rubber specialties, etc.

LIBERTY RUBBER CO., INC., February 4, 1927 (New York), capital 100 shares, no par value. Incorporators: Arthur Gerber, 583 Riverside Drive, New York City; Dora Gerber, 190 Glenmore avenue, Brooklyn, New York; and William E. Ohland, 3 Church street, New Market, New Jersey. Principal office, Manhattan, New York. To manufacture rubber articles.

MERCANTILE TIRE CO., INC., February 8, 1927 (New York), capital 100 preferred shares of the par value of $100, and 500 shares common, no par value. Incorporators: Abner Schoen, 1667 Nelson avenue; George Licsak, Jr., 240 West 24th street; and Helen Bernstein, 517 West 159th street, all of New York City. Principal office, Manhattan, New York. To manufacture tires.

MONTROSE SOLID TIRE CO., INC., January 12, 1927 (New York), capital 100 shares no par value. Incorporators: Henry Teichman and Eva Teichman, both of 172 Boerum street; and Robert L. Root, 89 Lefferts Place, all of Brooklyn, New York. Principal office, Manhattan, New York. Tires, etc.

HENRY PARKER, INC., January 12, 1927 (New York), capital $30,000. Incorporators: Frank P. Sweeney, Mary Collins, and Ray H. Schoemaker, all of 51 Chambers street, New York City. Principal office, 100-108 West 123rd street, New York City. To manufacture surgical elastic hosiery, supporters, etc.

THE FARKWAY TIRE SHOP, INC., January 21, 1927 (New York), capital $3,000, 1,000 shares no par value. Incorporators: Jacob Aronack, 592 Beach Terrace; Benjamin Eskin, 219 East 96th street, both of New York City; and Solomon Grabowsky, 1824 72nd street, Brooklyn, New York. Principal office, Manhattan, New York. Auto accessories, tires, etc.

THE SERVICE TIRE CO., December 29, 1926 (Kentucky), capital $5,000. Incorporators: Thomas M. Bibb, E. H. Robinson and J. F. O'Leary, all of Louisville, Kentucky. Principal office, Louisville, Kentucky. To carry on a general wholesale and retail tire and automobile accessories business.

STANLEY LABORATORIES, INC., February 10, 1927 (New York), capital 1,500 shares; 500 shares, par value $100; and 1,000 shares, no par value. Incorporators: M. U. Meagher, S. E. Vreeland and P. Abrams, all of 285 Madison avenue, New York City. Principal office, Brooklyn, New York. To prepare crude rubber for the market.

WARWICK TIRE CO., INC., February 2, 1927 (New York), capital $7,500. Incorporators: M. Gwynne Thomas, Mary P. Thomas and Lewis J. Stage, all of Warwick, New York. Principal office, Warwick, New York. Tires, etc.

WATERS RUBBER CO., November 15, 1926 (Maryland), capital stock $100,000, amount paid $5,000. Incorporators and officers: Burns H. Waters, president and treasurer; Ida L. Waters, vice president; and Henry L. Stanford, Jr., secretary. Principal office, 1 E. Lafayette avenue, Baltimore, Maryland. To deal in rubber products such as toy balloons, novelties, balls, bathing caps, acid gloves, rubber tubing, etc.

AMERICAN SHIPMENTS OF RUBBER BOOTS, 1924-1926

United States exports of rubber boots during the past three years have shown a steady increase, according to statistics prepared by the Department of Commerce, the figures rising from 680,346 pairs for 1924 to 907,426 for 1925, and 1,013,112 for 1926. In this market the United Kingdom easily led, taking in 1924 342,663 pairs, in 1925 516,927, and in 1926 635,751. Denmark and the Faroe Islands followed with 38,170, 70,000 and 129,101 pairs for the three years in question, other good customers being in the following order: Newfoundland and Labrador, Sweden, Germany, Iceland, Canada, Norway, Australia, and Austria.

The Rubber Industry in America

New York

The Taintor Co., manufacturer of "Taintor" whiting and paris white, has removed its offices from 2 Rector street to 75 West street, New York, N. Y.

The Raw Products Co. has moved its offices from 78 Wall street to 247 Park avenue, New York, N. Y.

On February 21, 1927, the **American Cyanamid Co.** moved its offices to the Mercantile Bank Building, 535 Fifth avenue, at 44th street, New York, N. Y. This removal also included the offices of the following associated companies: American Cyanamid Sales Co., Inc., Air Nitrates Corporation, Amalgamated Phosphate Co., Fumigators Supply Co., Inc., and the Owl Fumigating Corporation.

Axel L. Kopp is visiting this country as a representative of Julius Kopp, Copenhagen, Denmark, manufacturer since 1870 of rubber footwear. Coming to the United States at the age of twenty, Julius Kopp joined the Northern forces during the Civil War, eventually becoming an officer. He was in the battle of Gettysburg, and was also present at the Ford Theater in Washington when President Lincoln was shot. Although now ninety years of age, Mr. Kopp is still active and attends to business every day, H. A. Kopp being managing director of the organization. The firm of Julius Kopp has an excellent reputation, and is considered the largest of its kind in Scandinavia.

The Gutta Percha & Rubber Manufacturing Co., whose factories are at Buffalo, New York, have moved the sales offices to 15 Park Row, New York, N. Y.

The American Chain Co., Inc., Grand Central Terminal, New York, N. Y., is now in control of the Rubber Shock Insulator Co., which organization has been headed by A. F. Masury, chief engineer of Mack Trucks, Inc. Developed originally for use on trucks, this type of rubber device has been for some time the standard equipment for Mack units, while the rights for the passenger car field only have been vested in the Rubber Shock Insulator Co., the product having been standard for several lines of passenger cars.

Arthur S. Cullum, formerly associated with the Fisk organization, and later appointed treasurer of the Tucker Rubber Corporation, is now, as eastern sales representative, connected with the rubber service department of The Grasselli Chemical Co., 347 Madison avenue, New York, N. Y.

The New York Rubber Brokerage Co., 50 Broad street, New York, N. Y., represents a recent amalgamation of the business interests of M. Erenstoft, formerly secretary of The Crude Rubber Brokerage Co., Inc., and Arthur Gottehrer, formerly of Fred Stern & Co., Inc.

The Goodrich Silverton Cord Orchestra, originally instituted as a radio advertising feature by The B. F. Goodrich Co., Akron, Ohio, has gained great popularity, and was recently "headlined" at the Hippodrome, one of the largest vaudeville houses in New York City.

A factory addition is being erected at College Point, Long Island, New York, by the **I. B. Kleinert Rubber Co.**, 485 Fifth avenue, New York, N. Y., manufacturer of rubber sheeting and various sanitary specialties. The new building will be three stories, and is adjacent to the company's other constructions at College Point.

The Star Rubber Co., Akron, Ohio, has appointed S. A. Rockefeller as the company's special representative in the Long Island, New York, territory.

For the past two years the **Endicott Johnson Corp.**, Johnson City, New York, has maintained its own rubber plant, where soles and heels are manufactured. Three hundred dozen vulcanized canvas shoes are also being produced daily, and the output is soon to be increased. About March 1, the company's reclaiming plant will be in operation, this new division being capable of turning out 12½ tons of reclaimed rubber daily, all of which will be used in the sole and heel factory.

During the year ended December 31, 1926, the orders received by the **General Electric Co.**, Schenectady, New York, totaled $327,400,207, an increase of nearly $25,000,000 over 1925, and surpassing any previous year by almost $10,000,000. In the last quarter of the year the orders amounted to $80,406,570, compared with $78,636,669 in the same period of 1925.

Rhode Island

Reports from the several rubber manufacturing plants in Rhode Island indicate more activity since the beginning of the year than for some time previously and that the concerns are prepared for an indefinite period of better business. This is said to be applicable to all departments and has given much encouragement to both the management and the operating forces. Although details are as yet lacking several plants are known to be considering plans for extensions and improvements.

Motion pictures and addresses were the features of a meeting of the management and factory council of the **National India Rubber Co.**, held in the company's plant at Bristol, Rhode Island, on the evening of February 17. The speakers were Maurice C. Smith, Jr., factory manager; John E. Robinson, superintendent; and E. S. Beck, supervisor of safety of the United States Rubber Co. Motion pictures depicting scenes on the rubber plantations of Sumatra and a safety film were explained by Mr. Beck. Refreshments were served after the meeting.

The third and final account of Zenas W. Bliss, receiver for the **Bourn Rubber Co.**, Providence, R. I., was approved and confirmed January 26 by Presiding Justice Willard B. Tanner in the Superior Court. Four dividends, aggregating 31.5 per cent of the face amount of allowed claims totaling $271,636.24, have been paid. Receipts totaled $104,735.16 and disbursements amounted to $102,029.44. The disbursements included, in addition to the distribution for dividends, compensation for the receiver and counsel, $9,000; compensation of master, $1,000, and compensation of $450 to the receiver's agent. As soon as the balance now on hand is distributed, the receiver is to be discharged from further duties.

Matteo Capone has been elected chairman of the Factory Council of the **National India Rubber Co.**, Bristol, Rhode Island, with Manuel Paiva as vice chairman and Miss Bebe Hale as secretary.

There has recently been placed in the lobby of the **Industrial Trust Co.'s** building in Providence a handsome large bronze tablet in memory of **Col. Samuel Pomeroy Colt,** for many years president of the United States Rubber Co., former president of the Industrial Trust, and for years one of the most prominent financiers in this state. In medallion is a large bust of Col. Colt beneath which is the name, dates of birth and death and this inscription: "Founder of Industrial Trust Company, incorporated June 9, 1886. If you seek his monument look about you."

New Jersey

Conditions are beginning to improve considerably at all the Trenton plants where rubber products are manufactured. There has been an increase in all mechanical rubber lines and manufacturers are looking for a very busy spring and summer season. Plants turning out jar rings have placed extra help at work. Late winter has brought an increase in the production of tires and tubes and also heels and soles. Rubber cloth has been in steady production for several months. The hard rubber situation, in some instances, does not appear to improve very fast, but better conditions are anticipated.

At the annual meeting of the **Rubber Manufacturers' Association of New Jersey**, held at the Stacy-Trent Hotel, Trenton, New Jersey, the following officers were elected: President, Frank Voorhees, Voorhees Rubber Co., Jersey City; vice president, A. Boyd Cornell, Hamilton Rubber Co., Trenton; treasurer, C. Dudley Wilson, Luzerne Rubber Co., Trenton; secretary, Charles E. Stokes, Jr., Home Rubber Co., Trenton; all in New Jersey.

Clifford H. Oakley, president of the Essex Rubber Co., Trenton, New Jersey, has been elected vice president of the Mercer County Automobile Club. Joseph W. Thropp, of William R. Thropp & Sons Co., has been chosen a member of the traffic committee.

Four hundred male employes of the **Essex Rubber Co. and the Thermoid Rubber Co.**, both of Trenton, New Jersey, recently participated in an "Open House" affair at the Trenton Y. M. C. A. Various kinds of indoor sports were indulged in, including tug-of-war, bowling, etc.

Whitehead Brothers Rubber Co., Trenton, New Jersey, is very busy at the present time on orders for belting and packing, while the hose department is rushed with work.

The Joseph Stokes Rubber Co., Trenton, New Jersey, manufacturers of hard rubber, experienced a rather dull season during the early and middle winter months, but is now busy again. A general increase in the automotive industry has had a good effect upon the outlook at the Stokes plant.

The Thermoid Rubber Co., Trenton, New Jersey, reports that business has picked up considerably since the beginning of the year. The company is now very busy in all departments.

The Pocono Rubber Cloth Co., Trenton, New Jersey, announces that business is very good at the present time and the future outlook promising.

The Murray Rubber Co., Trenton, New Jersey, reports improved conditions, the mechanical rubber department being particularly busy.

The Vulcanized Rubber Co., Morrisville, Pennsylvania, reports that business is not very brisk at present, which is a seasonal condition that will improve by early spring.

The Kelly-Springfield Tire Co., 250 West 57th street, New York, N. Y., has established a direct factory branch at 403-5 High street, Newark, New Jersey, with R. E. Hastings in charge. The organization is now maintaining forty-four such divisions in various sections of the country.

Voorhees Rubber Mfg. Co. and American Rubber Products Co. Under Same Management

A. Y. Tucker, together with William J. Tompkins, vice president of the Tee Pee Rubber Co., of Buffalo, and Herbert S. May, formerly with the Bakelite Company, have secured the stock of the Voorhees Rubber Manufacturing Co., and also management control of the American Rubber Products Corp., both in Jersey City. A merger is not contemplated, but the companies will be operated in conjunction and their lines and sales expanded.

Officers of the Voorhees Rubber Manufacturing Co. are: Albert Y. Tucker, chairman and general manager; John J. Voorhees, president; William J. Tompkins, vice president; Frank D. Voorhees, vice president and treasurer; John W. Teller, vice president; Herbert S. May, secretary. Directors: Albert Y. Tucker, John J. Voorhees, William J. Tompkins, Herbert S. May, James Rattray, vice president of the Guardian Trust Company of Newark, New Jersey.

Officers of the American Rubber Products Corp. are: Augustine Davis, president; Albert Y. Tucker, vice president and general manager; Daniel E. Evarts, vice president; Robert Earl, vice president and treasurer; K. C. Madden, secretary; William J. Tompkins, assistant general manager. The above together with John T. Earl comprise the Board of Directors. Vice President Evarts is president of the New Jersey Title Guarantee and Trust Company of Jersey City.

John J. Voorhees, who is in charge of production of the Voorhees Rubber Manufacturing Co., is also factory manager for the American Rubber Products Corporation.

Two orders have been made directing the **Consumers' Rubber Co.**, 335 Pine street, Elizabeth, New Jersey, to show cause why a receiver should not be oppointed. One, signed by Vice Chancellor Backes, was presented by Hyman A. Rosenthal, trading as the Nearpara Rubber Co., Trenton, New Jersey, who charges the company has little cash. A petition presented to Vice Chancellor Church by L. Albert & Son, Inc., Trenton, New Jersey, declares that the company is insolvent.

A recent investigation conducted by the **Michelin Tire Co.**, Milltown, New Jersey, disclosed the fact that in all France the per capita ratio of automobiles is only one to every eighty persons, while in the United States it is one to every five persons. The Michelin company will now start a campaign to increase the number of automobiles in France and increase its business.

Pennsylvania

William J. Cahill has resigned as assistant secretary and treasurer of the General Tire & Rubber Co., Akron, Ohio, to go into partnership with Warren Wright, General tire distributer in Philadelphia, Pennsylvania.

George H. Duck is now advertising manager of the Lee Tire & Rubber Co., Conshohocken, Pennsylvania. He has had a wide experience in the automotive industry, having held positions of responsibility with various automobile and truck manufacturing organizations.

Executives of the **American Rubber & Tire Co.**, Akron, Ohio, announce that O. H. Jackson will act as the company's representative in eastern Pennsylvania, New Jersey and Virginia, with headquarters in Philadelphia. Robert C. Scott has also been appointed southwestern district manager, with headquarters in Dallas, Texas.

Vincent Sauchelli has been appointed agricultural chemist at the Koppers Company Laboratories, Mellon Institute for Industrial Research, Pittsburgh, Pennsylvania. He is well known in scientific circles, particularly for his researches in connection with plantation rubber. Thoroughly familiar with the growing of rubber in the Malay Peninsula, Java and Sumatra, Mr. Sauchelli, for five and a half years, was agricultural chemist to the Société Internationale de Plantations et de Finance, at the private scientific and experimental station at Kuala Lumpur, Federated Malay States. He is a graduate of the Massachusetts Agricultural College.

The Jorgensen Specialty Co., Hampton Road, Erie, Pennsylvania, manufactures rubber accessories for automobiles, such as "Josco" snap buttons, door silencers for closed cars, and hood silencers. Another specialty in druggists' rubber sundries is the Jorgensen hygienic teether.

Massachusetts

Rubber trade conditions in Massachusetts and New England have not been unusually active since the first of the year. Those branches of the industry whose products are used extensively in the automotive industries have been particularly quiet. From Detroit comes the report that the Ford plant ran only two days during the week of February 7-12. This condition effects many lines of rubber industry here such as carriage cloth, reclaimed rubber, hard rubber, extruded rubber, and webbing manufacturers who also are finding business slow.

In rubber footwear, the peak of the season has passed and most mills are shifting their schedules to tennis and summer goods, although advance bookings on winter merchandise are exceedingly promising. Tires for replacement seem to be in good demand which helps the New England tire makers as Fisk is the only mill here making original equipment.

Heel and sole production has shown signs of picking up for the usual spring demand. Insulated wire mills report good business and the sundry departments of Davidson and Tyer are operating full time.

The United States Employment Service monthly report for New England, just published, stresses the fact that activity in the rubber shoe industry continues at a high level.

The snow storm of Sunday evening February 13 and the slushy weather of the following week helped the retailers to clean up footwear stocks. Jordan Marsh Co., Boston's largest department store, had a feature display of the new styles in overshoes in its main window. Converse, Goodrich, and United States styles were shown.

Rubber tire manufacturers were somewhat disturbed by reports that Goodyear had reduced prices 7½ per cent on original equipment orders of manufacturers. While it does not affect sales to dealers, original equipment reductions have been usually followed by a cut to dealers, so that tire merchants' confidence in the stability of prices is undermined, and forward buying is halted. Reports from the Boston tire trade state that there will be a general revision in manufacturing prices effective May 1, probably amounting to a reduction of about 7½ per cent.

Two leading members of the rubber industry attended the annual reunion on February 5 of the English High School, Boston, Class of 1892. They were Paul W. Litchfield, president of the Goodyear Tire & Rubber Co., and George F. Hichborn, of the United States Rubber Co. Sixty members of the class sat down together for dinner at the Boston Yacht Club at the 35th annual reunion of the class. The Boston English High School is one of the oldest public high schools in the country and now has a total enrollment of over 3,000 boys. It was gratifying to his old classmates that Mr. Litchfield, president of the largest rubber company in the United States and the world, could take the time to come back to Boston and sit down with his boyhood friends and classmates.

Godfrey L. Cabot, Inc., 940 Old South Building, Boston, Massachusetts, manufacturer of carbon black, reports that C. R. Johnson has joined the organization in the capacity of technical director, and is organizing a carbon black research laboratory. Mr. Johnson has had much experience in both the natural gas and rubber industries. In establishing its new laboratory the Cabot organization plans the improvement of present carbon black standards and the development of new types of carbons from natural gas.

A party was given recently for **George H. Vose,** for 22 years assistant superintendent of the Beverly plant of the United Shoe Machinery Corp., Boston, Massachusetts, in honor of his 75th birthday. He responded to congratulations of officials and department representatives and was presented with a purse of gold and two bouquets of roses in behalf of fellow-employes by George C. Thomas, general superintendent. Moses B. Kaven, vice president of the company was also present. A letter of congratulation was received from E. P. Brown, president of the company. Mr. Vose is one of the oldest employes of the company, and has also been active in the Beverly Industrial School, Chamber of Commerce, Beverly Hospital, Rotary Club, and other civic organizations. He is a Mason and Odd Fellow.

George M. Powell, who has been appointed branch manager at Springfield, Massachusetts, by the Firestone Tire & Rubber Co., Akron, Ohio, has been associated with that organization for the past nine years, his activities having been centered mainly in the New England territory.

Michael J. Kelliher has been appointed factory sales manager by the Panther Rubber Manufacturing Co., Stoughton, Massachusetts. For about twenty-five years previously he had been associated with the United Shoe Machinery Co.

The Cambridge Rubber Co., Cambridge, Massachusetts, announced its new prices on February 1 with the listing of many new styles in the "Raynboot" line. An extensive advertising campaign has been launched, stressing the advantages of the low-cut overshoe for spring and fall wear. Already there are signs of the overshoe market being broadened more that ever by the novelty craze. The Cambridge plant is running full time.

It is a singular circumstance that the two Masonic lodges in Watertown, Massachusetts, are both headed this year by representatives of the rubber industry. Pequosette Lodge, A. F. and A. M. has for its worshipful master John P. Hach, assistant treasurer of the Reading Rubber Manufacturing Co., and the worshipful master of Victory Lodge, A. F. and A. M. is Herbert R. Baxter, formerly with the Hood Rubber Co., now superintendent of the E. H. Clapp Rubber Co., Hanover, Massachusetts.

At the annual meeting of **Bemis Associates, Inc.,** Watertown, Massachusetts, manufacturers of gutta percha products, the following officers were reelected: Robert M. Bowen, president and treasurer; William T. Jarvis, vice president and secretary. Directors: Robert M. Bowen, William T. Jarvis, Robert F. Wight, Harvard L. Mann, A. F. Howard.

E. R. Baxter, New England selling agent for the Springdale Finishing Co., Canton, Massachusetts, has resigned and will devote his time to other interests.

The novelty overshoe idea has been capitalized by the raincoat makers as well. Cambridge Rubber Co. and the United States Rubber Co. are now making raincoats and overshoes to match from the new tweed fabrics.

Converse Rubber Shoe Co.

Indications are that sales of the Converse Rubber Shoe Co., Malden, Massachusetts, for the fiscal year to end March 31, 1927, will top the $6,000,000 mark. Volume for the initial nine months was $4,293,679 against $3,618,564 for the corresponding period of the previous year. Total business for the entire 1925-26 fiscal year was $4,900,000. The Malden plant is running at capacity with 17,000 pairs daily, the largest ticket the company ever had. At the close of 1926 Converse had current assets of $3,432,580 against current liabilities of $1,163,912 or a ratio of three to one.

During December the company disposed of its tire business through sale of the tire subsidiary to the Converse Tire & Rubber Co. Converse Rubber Shoe Co. leases to the new tire company that part of its plant which was formerly devoted to the manufacture of tires. The shoe company also does the milling work of the tire company and sells it the semi-finished rubber. Converse Rubber Shoe Co. owns $732,000 worth of Converse Tire Co. stock. The old tire subsidiary was carried on the books at $1,103,667 as of December 31, 1925. Sale of the tire business enabled Converse Rubber Shoe to liquidate $400,000 of trade acceptances, which improved the company's position.

Ohio

A marked increase in tire and tube shipments to dealers has been noted within the past few weeks, and indications are that total business of the Ohio rubber companies for the first quarter of the year will be considerably larger than that of the same period in 1926. Retail sales have been stimulated by the recent mild weather throughout most of the United States, giving promise of an early spring. If such is the case the motoring season will get an earlier start, and bring about an increased consumption of tires.

Although no attempt is being made to push operations at top speed, most of the rubber factories are running on a full time basis. Production is not far from capacity, and in the case of certain plants which sell exclusively to dealers a higher rate of output is being maintained.

It is estimated that Ohio rubber factories exported more than half the $60,051,332 worth of rubber goods shipped abroad in 1926 by all American companies. The total in 1925 was $52,629,922. Foreign sales of each of the principal classes of rubber manufactures, including automotive rubber goods, footwear, mechanical rubber goods and other rubber manufactures, rubber sundries and specialties, rubber thread, hard rubber goods, scrap and reclaimed rubber, increased in value during 1926 against the previous year.

Total estimated production in the Akron district is over 120,000 casings and 140,000 tubes a day. Goodyear has been steadily increasing until a daily schedule of 45,000 casings has been reached. Firestone, with a daily production of 40,000 tires, is turning out more tires than it has ever produced. Goodrich is manufacturing more than 20,000 tires a day, in addition to a large amount of footwear and mechanical rubber goods. Miller's production is over 8,000 tires daily. The smaller companies, General, Seiberling, India, and Mohawk, are running practically at capacity.

Other large Akron companies, so far, have failed to follow the example of Goodyear in changing the tread design or construction of balloon tires. Miller recently started to feature its semi-flat tread balloon tire, but as a matter of fact this casing was perfected and has been on the market for over a year. Goodrich began the publication of advertisements calling attention to its Silvertown balloon tire tread which has been proven efficient and long wearing. Officials of Firestone say their tire construction and tread is the best in the world, and they do not contemplate any change.

Rubber brokers in Akron report little evidence of sustained buying except on declines in the crude rubber market. At the present they do not look for any substantial rise in the market owing to the large stocks of rubber on hand, abroad, and in this country. The fact that there are 25,000 tons of unused coupons in Malaya, which are now being shipped at the rate of 5,000 a month in addition to the 70 per cent export allowance, adds to the task of supporting the market.

Announcement was made February 16 of a cut of 7½ per cent in prices of tires to automobile manufacturers. This brought prices on original equipment business to the lowest levels on record, being 35 per cent below those of a year ago. Officials of one company explained that the reduction balances one made to dealers last fall. No further cut in prices to dealers in contemplated.

The Harshaw Fuller & Goodwin Co., manufacturer of chemicals and colors for the rubber industry, announces the removal of its offices to 1610 Hanna Building, Cleveland, Ohio.

The annual meeting of the **Mohawk Rubber Co.,** Akron, scheduled for February 14, was postponed for 30 days, because plans for new financing were not ready. Mohawk made an excellent showing in 1925, but suffered reverses in 1926, owing to the drastic shrinkage in its crude rubber inventories. For this reason the company needs more money for working capital. It is proposed to issue 25,000 shares of new common stock, and an issue of either bonds or debentures.

A. C. Fisher, former manager of accessories and tire chain sales at the Goodyear Tire & Rubber Co., has joined the India Tire & Rubber Co. organization as manager of accessories and repair materials.

Approximately 65 salesmen of the **India Tire & Rubber Co.,** Akron, Ohio, attended a general sales conference at the company's plant. All phases of tire manufacture and distribution were discussed, under the direction of **C. C. Prather,** general sales manager. Special dinners and entertainments were on the program. **W. D. Anderson,** president of the Bibb Manufacturing Co., spoke on "Cotton and Cotton Fabrics."

Construction has been started by the **Goodyear-Zeppelin Corp.,** on four dirigibles and seven balloons for the United States Government. Contracts for the ships, to cost approximately $500,000 were received by the company February 12, the order being the largest for lighter-than-air-craft in the country since Goodyear manufactured the gas cells for the ill-fated Shenandoah.

Manufacturing operations were started early in February in the new plant of the **Stardant Rubber Co.,** Barberton, near Akron. The factory is of brick construction, consisting of one story and a basement. It is equipped with new modern machinery for making dipped rubber goods. Among new lines to be added are rubber gloves, finger cots and rubberized fabric aprons. About 100 workers will be employed when operations reach capacity. Officials of the company are: F. J. Unger, Ray Hinds and A. L. Southward.

J. F. Jones, sales manager of The Mohawk Rubber Co., Akron, Ohio, has returned to Akron after a satisfactory busi-

Gammeter Retires from Goodrich

John R. Gammeter, for 30 years inventor at The B. F. Goodrich Co., Akron, Ohio, has severed connections with that company, effective February 20, and will devote his entire time to the development of inventions to be licensed to manufacturers.

More than 200 patents in the rubber industry are credited to Mr. Gammeter.

John R. Gammeter

Among these is the vacuum box for forming flat built tires to shape for inserting the water bags. The first machine-wound rubber golf ball was perfected by him. The Gammeter balloon valve has long been recognized in aeronautic circles throughout the world. One of his latest inventions is the Gammeter clay blow process, designed to eliminate air or water bags for curing pneumatic tires. Mr. Gammeter says this will save the tire industry millions of dollars annually if generally adopted. It is illustrated and described elsewhere in this issue.

The experimental laboratory which has been opened by Mr. Gammeter at 680 North Portage Path, Akron, Ohio, is open to all inventors, no matter how foolish their ideas may seem, he says.

ness trip to the eastern states. **P. H. Goodall**, assistant sales manager, has also been making a visit to mid-eastern territory, stopping at Buffalo, Jamestown, Rochester, and Pittsburgh.

B. J. Rodgers has again resumed his duties with The Star Rubber Co., Akron, Ohio. He is acting as special representative in charge of sales in the Ohio territory.

Sales of the **India Tire & Rubber Co.**, Akron, Ohio, for 1926 were $5,585,128, compared with $4,600,121 in 1925. The gain in total business was 21 per cent. Profits were lower, owing to the shrinkage in crude rubber inventories. Net earnings after depreciation, interest, taxes and all other charges, were $179,151.53, against $471,476.38 in 1925. Regular dividends were ordered paid on common and preferred stocks. All directors were re-elected.

Annual report of the **Akron Rubber Reclaiming Co.**, Barberton, Ohio, showed net sales for 1926 were $1,009,967, and net earnings $180,778. After federal taxes, other charges and preferred stock dividends, a surplus of $61,067 remained for the common stock. During 1926 plant extensions more than doubled the factory capacity. Operations are on a 24-hour a day basis, with prospects that similar conditions will exist through 1927. Officers of the company, besides Mr. Etling, are: William Welch, vice president and sales manager; J. M. Alderfer, second vice president, and William A. Hart, secretary and treasurer.

Business of the **Northern Rubber Co.**, Barberton, Ohio, was more than doubled in 1926. The company has started the manufacture of heavy duty truck tires and has many orders from distributers.

During the last six months the daily output of **The Columbus Tire & Rubber Co.**, Columbus, Ohio, has averaged 500 tires. The production of tubes has recently been resumed, and under the proposed schedule 1,000 a day will be manufactured, and approximately the same number of tires. John W. Zuber is secretary.

Expansion both in the tire and tube department and in the heel and sole department of the factory is announced by officials of the **Lancaster Tire & Rubber Co.**, Lancaster, Ohio. Present capacity of 1,500 casings and 2,000 tubes a day is expected to be increased by 50 per cent. A department in rubber cement is now being developed. President E. E. Lerch and other directors were reelected at the annual stockholders' meeting.

G. S. Shaeffer has been reelected president of the Triangle Tire & Rubber Co., Canton, Ohio. Sales in 1926 increased 42 per cent over the previous year, it was announced at the annual meeting.

William J. Slater, receiver for the **Weldman Tire & Rubber Co.**, Port Clinton, Ohio, announces that the plant is to be sold under order of the United States Court. The Wildman factory, formerly known as the Ohio State Rubber Co., went into receivership several months ago. The factory was taken over by the Wildman interests four years ago.

R. R. Olin, well-known for twenty years as a rubber chemist and technologist, has established fully equipped control, testing and experimental laboratories at 852 Wall street, Akron, Ohio, his purpose being to make available to the smaller rubber manufacturers at reasonable cost and along cooperative lines, certain facilities which previously could be afforded only by the larger organizations.

S. G. Luther has resigned from The Philadelphia Rubber Works Co., Akron, Ohio, where for the past seven years he has been in charge of experimental work. During 1915 and 1916 Mr. Luther spent some time in Russia on business for the company, while in 1918 he was appointed manager of the Philadelphia plant. Since 1919 he has been associated with the Akron division in the development of new products.

Stephen G. Luther

The Goodyear Tire & Rubber Co., Akron, Ohio, opened its new cotton fabric mill at Cedartown, Georgia, on February 21, 1927. Together with the four other fabric units, the company will be able to produce half of all the fabric consumed in its tire plants. Clifton Slusser, vice president; S. A. Steere, manager of fabric production; and Hugh Allen, publicity manager, represented the Akron management at a banquet given in the Wayside Inn at Cedartown on the opening night. The governor of Georgia and other officials were guests.

The Inland Manufacturing Co., Dayton, Ohio, a division of the **General Motors Corporation**, has recently completed the construction of an additional plant for the manufacture of hard and soft rubber and other molded automotive parts. The new building, costing approximately $250,000, is about 360 feet long by 125 feet wide and contains 50,000 square feet of floor space. In February operations began in the new plant. W. S. Whittaker is president and general manager of the Inland organization.

Suit for an accounting and a fifth interest in royalties accruing to **L. A. Laursen**, of Akron, inventor of the water curing process for tires and tubes, has been filed in the United States district court at Cleveland by **Harry L. Lowe**, of Eau Claire, Wisconsin. Mr. Lowe claims to be Laursen's partner and that he was to share in the royalty when $100,000 had been accumulated by Laursen. The Court granted a temporary restraining order against the further payment of royalties by the rubber companies. Those now using the patents are the Seiberling Rubber Co., Mansfield Tire & Rubber Co., Goodyear Tire & Rubber Co., The B. F. Goodrich Co., United States Rubber Co. and Ajax Rubber Co.

The Goodyear Stockholders' Litigation

New developments, bringing out sensational charges and counter charges by both sides, have come thick and fast during the past few weeks in the maze of litigation surrounding the financial affairs of the Goodyear Tire & Rubber Co. Hearings and suits have been held in courts of Akron, Ohio, New York, N. Y., and Toledo, Ohio. Preliminary skirmishes in the legal battle between stockholders and Dillon, Read & Co., for control of the company, have resulted so far in victories for the stockholders in Akron and New York and reverses in Toledo.

An important phase of the stockholders' litigation was the application before the Toledo Federal Court of Mrs. Katherine G. Benedict, of New York, for an injunction restraining the common stock voting trustees from exercising their powers. All the trustees are named but the action is aimed directly at F. A. Seiberling and his associates who constitute a majority of the voting trust. Seiberling's attorneys first lost in their attempt to have the trial heard by another judge. Another reverse was on February 8, when Judge Killits upheld plaintiff's status as a stockholder. The defense had alleged that Mrs. Benedict bought her stock shortly before the court action, and was really acting at the behest of the Goodyear management. The court also overruled motions of defense counsel to postpone the hearing.

At the conclusion of the hearing Judge Killits issued an injunction restraining the holding of the Goodyear annual meeting, scheduled for March 28, until he has given a decision on the Benedict application.

Pacific Coast

Convinced that further tire price-cutting is most unlikely, and that the time is nearly ripe for a revision upward, tire and tube manufacturers and distributers on the Pacific Coast and in the territory west of the Rockies are in a much more cheerful mood than they have been in in several months. They have been encouraged, too, with a sales volume comparing well with that of a year ago, excellent weather conditions, better marketing practices brought about with the aid of trade associations, and a generall healthy state of business. Leaders say they see no reason to modify their forecast that 1927 will be one of the rubber industry's best years.

Rubber manufacturers on the Coast report a growing demand for their products in the Hawaiian Islands, the Orient, Siberia, Australia, New Zealand, South America, the Dutch East Indies, and the Straits Settlements. To further such trade, the Kerr (British) Lines have just established a California-Orient service with regular, direct transportation between San Francisco and Los Angeles and Sumatra and Singapore, using six modern motorships formerly used in carrying rubber and Oriental products from the Far East to New York. One of the ships, the *Silverlarch*, is now bringing the first direct cargo of rubber from Sumatra.

C. S. Dickey, treasurer and general manager of the Corduroy Tire Co. stores, has been making an extensive business trip through the Coast territory.

Shelby A. Falor, of the Monarch Rubber Co., Hartsville, near Akron, Ohio, has been visiting the chief cities on the Coast to arrange for the distribution of Monarch tires.

According to Secretary Elliot H. Pierce of the **Plant Rubber & Asbestos Works**, 537-539 Brannan street, San Francisco, indications are that the first half of 1927 will at least equal the good record of the first six months of 1926. A very gratifying increase in orders is reported thus far for water, steam, oil, and suction hose, as well as for high-pressure steam and flax packings. Transmission belting, however, has been rather backward. The company is quite proud of its new magnesia mill at Redwood City, buil to replace the one totally burned a year ago, and which is much larger and better equipped. Lessened production cost and improved sales are rapidly taking up the slack caused by the fire loss.

The C. Benedict Manufacturing Co., makers of rubber dress shields, light aprons, bathing caps, infants' wear, etc., 1058 Mission street, San Francisco, report a steady improvement in sales. M. E. Dorman is president, and Harold Hyman, secretary.

H. M. Bacon, Pacific Coast district manager for The B. F. Goodrich Co., is much gratified with the sales volume thus far in 1927, and finds trade prospects very encouraging for the remainder of the year. The company recently bought a site on 16th street, Sacramento, for a $30,000 branch building. A widely-circulated report that the Goodrich company is planning to establish a branch factory in Southern California lacks confirmation, and it is said to have been started by some real estate interests that have been trying to induce the big Akron concern to follow the Goodyear example.

The Samson Tire & Rubber Co., Compton, California, has quite completed its fifth extensive addition to its plant. The tire output is reported as having increased eight-fold within three years.

J. B. Magee

With over fifteen years' experience with the United States Rubber Co., J. B. Magee, manager of the Los Angeles branch and the San Diego and Phoenix sub-branches, is highly rated among the distributers of rubber goods in the Southwest.

J. B. Magee

Mr. Magee was born October 27, 1886, in Watertown, N. Y.; and after leaving high school entered a preparatory school and later Rensselaer Polytechnic at Troy. After spending some time with the Brown & Sharpe Co., Providence, R. I., and the Carborundum Co., Niagara Falls, N. Y., he entered the Pacific Coast Division general sales department of the United States Rubber Co., San Francisco, in 1911. When the tire company branches and the rubber company stores were consolidated, Mr. Magee was made manager at Phoenix, Arizona. In December, 1915, he was put in charge of the Los Angeles branch with about one-tenth the present number of assistants, and since then the Phoenix and San Diego sub-branches have been put under his supervision. He is a Mason, and a member of the Los Angeles Athletic Club, Rotary Club, and the Commercial Board and the Chamber of Commerce of Los Angeles. His home is at 6646 Maryland Drive, and his office at 784 South San Pedro street, Los Angeles, California.

L. F. Fitzgerald, 2534 South Hill street, Los Angeles, California, has been chosen as chairman of the Tire Dealers' Division of the Southern California Automobile Trades Association, with B. Wynns, vice chairman, and H. B. Pier, secretary, The division has forty-five members, and an active campaign has been started to increase the roster. The general purpose of the division is to raise trade standards among tire sellers and it will welcome as members not only those selling new goods but also dealers in retreads who are willing to reasonably safeguard buyers.

Mid-February daily production of the **Goodyear Tire & Rubber Co.**, Los Angeles, California, averaged 6,800 casings and 7,000 tubes. While the new building may not be finished before April 1, considerable equipment has already been installed and every effort will be made to start production at an early date. It is estimated that the addition will enable the company to produce 1,000 more tires daily, as well as affording needed storage space.

In a fire that did nearly $40,000 damage, the **West American Rubber Co.**, 400 North Avenue 19, Los Angeles, California, got a severe setback recently, but operations were resumed next day and the rush of orders has since been well handled, according to President Douglas Radford. Double shifts are now employed in getting out rotary hose, special packings, and general mechanical goods. A unique product, a rubber heel of two different compounds, is being made at the rate of 1,000 pairs daily.

The Rubber Products Company of America has removed its main office from Los Angeles to its new factory at Bates City near Redondo Beach, California, where it makes floor covering, largely from vulcanized rubber.

According to C. J. Evans, general manager of the **Cactus Manufacturing Co.**, 914 East 59th street, Los Angeles, California, the New Orleans branch has been closed and southern sales will be made direct to jobbers. It will, however, maintain its branches in Cincinnati and at the Bush Terminal, Brooklyn, N. Y. The company specializes on a steel-needle studded tire boot, and recently it ininstalled a machine which, with the aid of two men, will insert all the needles, and do the work of thirty men hitherto employed.

One of the few resistance-to-abrasion machines in use on the Coast has just been installed by the **W. J. Voit Rubber Co.** (formerly the V-T Rubber Co.), and the laboratory at the works, 970 South Alameda street, Los Angeles, California, has also been much improved. The company has been in operation since January, 1924, and manufactures chiefly camelback and other tire repair stock.

Pacific Division Manager J. B. Brady of the United States Rubber Co. spent several days in February conferring in Los Angeles with Branch Manager J. B. Magee about trade conditions in the Southwest. Mr. Magee and his assistant, H. O. Bock, recently returned from a visit to the sub-branches in San Diego and Phoenix. W. T. Joplin, salesman in the Hollywood district, has been made manager of the Phoenix sub-branch and Jack M. Evans, who was in charge there, has joined the Los Angeles force. C. J. Noonan, manager of the footwear and clothing department at Los Angeles, has been transferred to Phoenix.

The Golden State Rubber Mills is the new name of the Long-Turney Corporation, 1920 East Vernon avenue, Los Angeles, California. G. S. Long is president, and G. H. McDonald is secretary-treasurer. The company recently added a new mill and other machinery to its equipment, and it has been exceptionally busy during the past two months, making not only general mechanical goods but also oil field pistons, packings, and swabs, chiefly for South American and Russian trade.

The Western Rubber Co., which moved recently from 128½ South Beaudry avenue to 809 South San Pedro street, Los Angeles, California, where it has doubled the space, finds a considerable increase in business, according to George T. Matsunaga, manager. The company retreads tires and makes camelback from material composed of ground solid tires and pneumatic treads mixed with crude rubber and vulcanized under high pressure.

The General Belting & Supply Co., Inc., Everett, Washington, handles rubber belting, hose, tape, matting, packings, etc., as jobber and distributer for The Mechanical Rubber Co., Cleveland, Ohio, a subsidiary of the United States Rubber Co.

The Lancaster Tire & Rubber Co., of Lancaster, Ohio, has leased the building at 605 Washington street, Portland, where it will establish the first of a chain of Pacific Coast retail stores.

One of the factory buildings, known as Unit No. 19, of the **Gates Rubber Co.**, Denver, Colorado, is nearing completion and by April 1 production will be at full capacity. The business of the Gates organization is showing a steady and consistent growth, the tire business of last year indicating a 48 per cent gain over that of the previous year. During 1927 a further increase of 50 per cent will be scheduled. The company is said to be largest manufacturer of fan belts and radiator hose in the world, the output at the Gates plant of the latter class of goods being three and a half miles daily. January sales of both fan belts and radiator hose were 10 per cent greater than during any former month in the company's history.

Midwest

The Century Rubber Works, 54th avenue and 18th street, Chicago, Illinois, has appointed J. Harlam as sales manager for the Illinois territory. Mr. Harlam is to report to Albert Olson, manager of the Chicago branch.

The Better Tires Co., Michigan avenue and 18th street, Chicago, Illinois, is constructing a four-story addition to its present plant. Harry Alter is president.

A new branch has been opened at 214 South Pennsylvania street, Indianapolis, Indiana, by **The Mason Tire & Rubber Co.**, Kent, Ohio. A. S. Cahn will supervise the sales in this new division as well as in Cincinnati, while G. E. Drake will be in charge of branch operations.

The HiLab Products Co., a division of the Hide Leather & Belting Co., Indianapolis, Indiana, is now adding to its line a new type of rubber fan belt. Thomas Moore is sales manager of the HiLab organization.

A favorable decision was rendered at Kansas City in the District Court of the United States regarding a process of repairing inner tubes as patented by the **Bowes "Seal-Fast" Corporation**, Indianapolis, Indiana. The patent in question was granted in April, 1924, to Robert M. Bowes and his brother, Charles E. Bowes.

Quick Tire Service, Inc., is a distributer of United States tires at 936 North Meridian street, Indianapolis, Indiana.

The Accurate Tire Co., 5452 24th street, Detroit, Michigan, was organized in 1926 for the purpose of distributing Hood solid tires in the Detroit territory. The organization has now added to its stock a full line of Hood pneumatic tires. L. H. Saunders is vice president.

Sheldon P. Thatcher, who since last July has been technical assistant to the president of the United States Rubber Co., 1790 Broadway, New York, N. Y., has been made second vice president of the organization. Mr. Thatcher will also be in charge of the manufacturing in the tire division, and will make his headquarters at the Morgan & Wright factory in Detroit. He is a graduate of the Yale Sheffield Scientific School and the Massachusetts Institute of Technology. For the past seventeen years he has been associated with the United States Rubber Co.

Another executive who has been associated for a number of years with the organization in various capacities and who will also make his headquarters in Detroit is B. J. Lemon, recently promoted to the position of field engineer, as representing the tire division development department.

W. W. Coe has been appointed general sales manager of the Racine Horseshoe Tire Co., Racine, Wisconsin, he having formerly served in the capacity of Southwestern district manager. Mr. Coe will make his headquarters in Racine.

The American Rubber & Tire Co., Inc., Akron, Ohio, reports that R. R. Robinson is now the company's representative for the state of Nebraska, with headquarters at Lincoln.

The Anderson-Prichard Oil Corporation, Colcord Building, Oklahoma City, Oklahoma, has established its third refinery at Wichita Falls, Texas, the plant having been organized for the refining of technical naphthas used by the rubber industry.

Southern

The Virginia Carolina Rubber Co., Inc., Richmond, Virginia, is now carrying on operations in its new factory on Lewis street, the present building representing various extensions and improvements over the previous structure, which some months ago was damaged by fire. The organization specializes in the manufacture of Va-Car tire plasters and other repair material. C. W. Myers is general manager.

An additional building has been recently erected by the **Lawson Rubber & Manufacturing Co., Inc.**, Dallas, Texas, in order to replace one destroyed by fire last December. The organization specializes in the production of tire boots and Stixtite patches. J. R. Lawson is president, and E. R. Lawson is vice-president.

Charles P. Stearns, formerly associated with the Goodyear organization and later assistant sales manager for the Dunlop Rubber Co., is now southeastern branch manager of the Century Rubber Works, 54th avenue and 18th street, Chicago, Illinois. Mr. Stearns will make his headquarters at Atlanta, Georgia.

Extensive enlargements of some of the buildings constituting the **Callaway** group of mills, located in La Grange and other points in Georgia, were completed during the past year, while important changes were also made in the company's power system. The Callaway company manufactures hose and belt duck, and other special fabrics for the rubber trade.

During the past year the manufacture of tire fabric yarns was begun at the new factory known as the **Galvez Mills**, Galveston, Texas. The two-story building, modern in every respect, measures 299 by 103 feet, and is equipped with 14,000 spindles.

Canada

If the 1927 Montreal Motor Show is a barometer of the prospects for the automotive industry for the coming year, motor car manufacturers may look forward with unbounded optimism. Large numbers of cars were sold and hundreds of prospects obtained which will keep salesmen busy for some time, all of which augurs well for the Canadian rubber industry.

All previous attendance records were surpassed and an increase of over 30 per cent was registered. The total value of automobile trucks, accessories, etc., on display amounted to $1,034,131, of which $859,356 represented automobiles and trucks, and $174,775 the accessories. Forty-four exhibitors showed 245 different models of automobiles and trucks. There were 20,000 items of accessories, with 2,179 makes shown by 50 exhibitors. The lowering of the tariff was reflected in the greater volume of advance sales of 1927 models at the show.

The Goodyear Tire & Rubber Co., of Canada, Ltd., is operating the rubber works at New Toronto and Bowmanville, and the cotton plant at St. Hyacinthe, Quebec, to capacity, and production records have been broken in the last week or two. Goodyear profits for the year ended last September 30, were at the record figure of $2,246,641. While enhanced prosperity accounts in a large measure for the growing domestic sales of both tires and other rubber manufactures, the company has shared proportionately in the increased export business.

At the annual meeting of the Mutual Benefit Association of the **Dunlop Tire & Rubber Goods Co., Ltd.**, Toronto, the following officers were elected for the ensuing year; Honorary Presidents, Hon. E. B. Ryckman, K. C. M. P., and J. Westren; honorary vice presidents, A. E. King, and D. E. Beynon; president, H. Saunders; vice president, J. Neville; secretary treasurer, T. P. Arlett, medical officer, Dr. A. A. Staley; representatives, Messrs. Fricker, Pomfret, Bailey, Sykes, Andrews, Watson, Shackleton, Gregg, and Childs.

R. C. Berkinshaw, Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ontario, delivered an address on the legal aspects of the secretaries' duties, at the last meeting of the Students' Society of the Chartered Institute of Secretaries.

Reports emanating from Toronto point to still further reductions on tire prices which should be effective almost daily. As far as can be learned, truck and bus tires may possibly be the only lines affected.

T. Y. O'Neill, sales manager of the Miner Rubber Co., Ltd., Montreal, has recently returned from a western trip, in the course of which he called upon the trade in the principal cities from Winnipeg to the Coast.

The Eastern Division of **Gutta Percha & Rubber, Ltd.**, recently met in conference in Montreal. Those in attendance from the Toronto head office, included Messrs. H. A. Galt, and Mr. Kerr.

A number of branch managers of the **Kaufman Rubber Co., Ltd.**, recently visited the head office at Kitchener, Ontario, among those present being A. A. Foy, Winnipeg, branch manager; Leonard B. Hutchison, Toronto, manager; E. E Code, Ottawa, manager; E. Moree, Montreal, manager; J. L. Langlois, Quebec, manager, and H. H. Meinzer, division manager.

A novel float was recently shown by the **Canadian Goodrich Co., Ltd.**, Kitchener, Ontario, in the Christmas parade, in which the old nursery rhyme read "There was an old lady who lived in a shoe and nothing but Zippers for her children would do." The new Lo Zipper has made its appearance for spring wear in three colors, black, fawn, and grey. The retail stores handling this Goodrich product report healthy sales.

Unsecured creditors of the old **Gregory Tire & Rubber Co., Ltd.**, of Vancouver, British Columbia, are required by an order of the Supreme Court of the Province to file all their claims by March 1, 1927, with the Westminster Trust Co., New Westminster, B. C., in order to get fully paid-up shares of the new Gregory company, which was organized in 1926 to take over the production of Gregory tires and tubes. The head office and factory are at Port Coquitlam, 17 miles east of Vancouver. The new officers are: President, R. L. Cliff; vice president, Melville Dollar; managing director, R. E. Jamieson, and secretary, Edward Riddell.

Mackenzie White and Dunsmuir, exclusive representatives for Firestone tires, have taken possession of their new quarters at 635 Burrard street, Vancouver, B. C. They are very optimistic as to the future, and this year in particular.

A new industry has been established in North Colchester County, Nova Scotia, by the **Oxford Tripoli Sales Co., Inc.**, for the purpose of working a deposit of infusorial earth used by the rubber trade. The raw material is shipped to the company's plant at Haverstraw, New York, for grinding and refining.

Business with the Canadian branch of the **Jos. Stokes Rubber Co.**, Trenton, New Jersey, which is located at Welland, Ontario, is in a flourishing condition. They manufacture hard rubber sheets, rods, tubes, and molded storage battery containers, jars, covers, and separators; soft rubber molded goods to specification, stamp gums, sponge erasers, bands, washers, etc. P. O. Gunkel is manager.

Maritime Province shoe men are discouraged about weather conditions, as January was a poor month and February, up to the time of writing, has been no better. It looks as though there were going to be some stocks of overshoes, lumberman's rubbers, and larrigans, carried over for another season. In December it looked as though stocks of rubbers and overshoes were going to be nicely cleaned up, but there is a very different story being heard today.

Canadian Connecticut Cottons, Ltd., Sherbrooke, Quebec, is very active and the plant is working two shifts a day.

Canadian R. A. Dinner

The seventh annual dinner of the **Rubber Association of Canada** was held at the Windsor Hotel, Montreal, February 11, 1927, more than two hundred members and guests from Canada and the United States attending. J. D. Hathaway, president of the association, acted as toastmaster, the chief speakers being Senator George P. Graham, and Rev. Malcolm A. Campbell, pastor of the First Presbyterian Church, Montreal.

In a brief address Mr. Hathaway reviewed conditions in the Canadian industry during the past year, reporting a most satisfactory export and import trade. Although business still continued excellent, Mr. Hathaway was of the opinion that it might show some slackening in 1927 as compared with 1926.

Senator Graham commented on the healthy business rivalry existing between Canada and the United States, adding further that a community spirit must be developed among Canadians, and that the country should realize the extent of its responsibilities as a nation within the British Commonwealth.

Rev. Campbell stated that, in order to meet the complexities of the present age, both Canada and the United States needed to steady themselves through reverence for traditions; the spirit that animated the pioneers of both countries should not be forgotten.

A report of the year's progress in the rubber industry was presented by J. D. Hathaway, president of the association. With him at the head table were C. N. Candee, C. H. Carlisle, W. A. Eden, Hon. George P. Graham, F. R. Henderson, E. W. BeSaw, T. B. Tomkinson, F. L. Freudmann, Rev. Malcolm A. Campbell, A. L. Viles and J. Westren.

Seventh International Rubber Exhibition

THE Seventh International Rubber and Other Tropical Products Exhibition, held January 21 to February 6 at the Grand Palais, Paris, France, has been most successful, one of the contributing factors to this success being the interest and co-operation shown by many who are conspicuous in the fields of science, politics, and commerce. Various governments have participated by means of interesting displays, while many individual rubber manufacturing concerns have ably assisted in representing the separate divisions of the industry.

The Exhibition was opened 11 A. M., January 21, M. Perrier, Minister of the Colonies, presiding, a large and distinguished gathering being in attendance. In proposing a vote of thanks to M. Perrier, Sir Wyndham Dunstan referred to the spirit of cordial cooperation which had been shown in the preparations for the Exhibition, which he designated as "a Franco-British effort . . . of great service in bringing together those of different nationalities engaged in the same work." The various sessions of the conference, beginning January 24, had also been carefully planned, many of the leading men of the industry contributing by papers or addresses. The following leading rubber manufacturers were represented.

Belgium

Société Englebert, Fils & Cie., rue des Vennes, Liège. "Englebert" pneumatic tires, rubber belting, soles and heels.

Société Colonial Rubber, Quai du Strop, Gand. "Colonial" pneumatic tires, tire repair outfits, and ebonite for all purposes.

Société Jenatzy-Leleu, rue Stéphenson, Brussels; et Sclessen, près de Liège. Mechanical rubber goods, "Jenatzy" pneumatic tires, "Overman" solid and semi-pneumatic tires, rubber soles, and ebonite goods for all purposes.

Société O. & R. Gheysen Frères, 16 rue Van Lint, Brussels. General mechanical rubber goods, soles and heels, and "Gheysen" pneumatic tires and mudguards.

Société Pour le Commerce et l'Industrie du Caoutchouc, Anderlecht-lez-Bruxelles; et Alost. General mechanical rubber goods, sheet rubber, surgical and sanitary goods, toys and balloons, etc.

France

Bergougnan, Société Generale des Etablissements, Clermont-Ferrand. Solid and pneumatic tires for all purposes, general mechanical rubber goods, shaped and revolving heels.

F. Bergucrand et Cie., 72, rue de Archives, Paris. Surgical and mechanical rubber goods.

Bognier et Burnet, Société des Etablissements, 21-23 rue des Filles-du Calvaire, Paris. Cut sheeting, surgical goods and those for sports, and general mechanical rubber goods.

La Canalization Electrique, Société Anonyme Trefileries et Laminous du Havre, à Saint-Maurice (Seine). Insulated cables, uncovered wires, etc.

Forges et Ateliers de Construction Electriques de Jeumont, Cablerie de Jeumont, Jeumont (Nord). Insulated wires and cables.

Etablissements Industries de E. C. et A. Grammont 10 rue d'Uzés, Paris. Electrical rubber goods and insulated wires and cables.

India Rubber, Gutta Percha & Telegraph Works Co., Ltd. Persan (Seine-et-Oise). General rubber manufactured goods, including floorings, insulated wire and cables, etc.

Manufacture d'Isolants et d'Objets Moules de la Compagnie Generale d'Electricité, 54 rue la Boétie, Paris. Molded goods for all electrical applications.

Société Alsacienne de Construction Mecanique (Cablerie de Clichy), 150-160 Quai de Clichy, Clichy (Seine). Insulated wires and cables for all purposes.

Société Electro-Cable, 2 rue de Penthièvre, Paris. Insulated wires and cables, and rubber carpeting.

Société Industrielles des Telephones, 25 rue du Quatre-Septembre, Paris. Insulated wires and cables, mechanical rubber goods, "Young" tennis balls, rubber carpeting, shoes, waterproof garments, etc.

Gratieux, Fernand, Paris-Billancourt. General manufactured rubber goods.

Hutchinson, Etablissements, 124 avenue des Champs-Elysées, Paris. Solid and pneumatic tires and tire accessories, waterproof balloon fabric, waterproof garments, rubber overshoes and sport shoes, general surgical and sanitary goods.

Manufacture de Caoutchouc et d'Ebonite, Paul Jeantet et Cie., 76 avenue de Paris, Gennevilliers (Seine). Ebonite for use in many industries, and general molded articles.

Etablissements Kalker, 2-16 rue des Bruyères, Les Lilas (Seine). General mechanical rubber goods, automotive accessories, rubber gloves, erasers, etc.

Société Anonyme "La Gutta Percha," 5 Chemin Latéral, Alfortville (Seine). General manufactured gutta percha goods.

V. Le Renard et Ses Fils, 90 rue Déterville, Alfortville (Seine). General mechanical rubber goods, ebonite, rubber thread, sheet rubber, gloves, etc.

Société d'Exploitation des Etablissements Lick et des Brevets Paramount, 93-5 rue Mirabeau, Ivry-sur-Seine. General surgical, sanitary, dental and electrical goods, also bathing caps, balls, toys, etc.

Manufacture de Caoutchouc de Saint-Ouen-sur-Seine, 3-5 rue Kléber, Saint-Ouen. General mechanical rubber goods, accumulator boxes, insulating plates. sheeting, valves, etc.

Dunlop, Société Anonyme des Pneumatiques, 64 rue de Lisbonne, Paris. Pneumatic and solid tires, tennis and golf balls, automotive accessories, etc.

"Dynamic," Compagnie de Caoutchouc Manufacture, 34 rue Piat, Paris. Hose rings, washers, "Dynamic" joints, insulating plates, etc.

Compagnie Francaise du Caoutchouc, 31 avenue du Roule, Neuily-sur-Seine. "Ducasble" tires, solid tires, airship envelopes, rubber hose, rubber thread, and dental goods.

B. F. Goodrich, Société Francaise, 221 boulevard de Valmy, Colombes (Seine). "Goodrich" transmission and conveyer belting, hose, cushions, rubber covered rollers, linings for vats, boilers, etc., joints and sheets, pneumatic and solid tires, accessories, etc.

Maurel Frères et Cie. (Rivolia). 140 rue de Rivoli, Paris. "Rivolia" waterproof garments and silk and cotton fabrics.

Michelin et Cie., Clermont-Ferrand. Latest models of pneumatic tires.

Oyenhart, Vichy (Allier). Surgical and sanitary rubber goods.

Etablissements Pax, 102 avenue Jean-Jaurès, Argenteuil. Pneumatic tires for motor cars and aeroplanes, ebonite rods, tubes, sheet and panels and general molded articles for electrical purposes.

Etablissements Pax, 102 avenue Jean-Jaurés, Argenteuil. Waterproof clothing and fabrics.

Alfred Plisson (Etablissements Delamotte), 68 rue Jean-Jacques-Rousseau, Paris. Rubber surgical instruments.

H. et F. De Poix et Cie., boulevard de Maréchal Joffre, Rueil (Seine-et-Oise). Rubber sponges, ebonite sheet, accumulator boxes and insulating plate.

W. Russell, 13-17 rue des Bateliers, Clichy (Seine). Pneumatic tires, hose, waterproofed garments and fabrics.

Schoenfeld Frères, 16 boulevard de Strasbourg, Paris. General surgical and sanitary rubber goods, toys, bathing caps, gloves, etc.

Société Chimique du Caoutchouc, 1-3 rue Henri-Murger, La Plaine Saint-Denis. "Etouffson" and "Stamber" brands of rubber

carpet, cloth for motor car hoods, and "Paraverse" waterproofed fabric.

Société des Specialties Mecaniques (Manufacture de Caoutchouc), 25 et 25 bis rue Saint-Ambrose, Paris. General mechanical goods and molded rubber articles.

P. Viault, 23 rue des Francs-Bourgeois, Paris. General surgical and sanitary rubber goods.

S. Wolber, 17 rue de Villeneuve, Soissons; 76 rue des Arts, Levallois-Perret. Pneumatic tires for all purposes, and motoring accessories.

Waterproof Clothing Displays

The following companies made effective displays of waterproof clothing: Dietz (Veuve Edmond) et Ses Fils, 56 rue d'Aboukir, Paris; Hutchinson, Etablissements, 124 avenue des Champs-Elysées, Paris; Le Par' Tout, 190 rue Lecourbe, Paris; Le Vêtement Impermeable, 41 rue de Maistre, Paris; Maurel Frères et Cie., 140 rue de Rivoli, Paris; Rabanet et Trusson, 148 rue Montmartre, Paris; Schourmann, I, 74 rue Jean-Jacques-Rousseau, Paris; Société du Caoutchouc Manufacture, 86 rue Notre-Dame-de Nazareth, Paris; and Société Industrielle des Telephones, 25 rue du Quatre-Septembre, Paris.

Rubber Factors

Alcan et Cie., 87 rue Saint-Lazare, Paris. Samples of crude rubber and balata, also crepe rubber for soles.

Mieg, Charles et Cie., 7 rue Gay-Lussac, Mulhause (Haut-Rhin), specializes in fabrics for the rubber trade, the agent for France being Louis Maire, 17 rue de Sévingné, Paris.

Société Anonyme Ferd. Lousbergs, Filature et Tissage de Coton, Quai du Bas-Escaut 5, Gand. Various fabrics used by the rubber trade.

Compagnie d'Applications Mecaniques, 15 avenue de la Grand-Armée, Paris. Various appliances for rubber machinery.

Organizations specializing in reclaimed and waste rubber included the following: Louis Gallois, Chateau Chinon (Nièvre); Etablissements Arthur Gobert, 28 boulevard Dubois, Dreux (Eure-et-Loire); Société Commerciale du Caoutchouc, rue Edouard-Vaillant, Le Bourget; Société des Recuperes Reno (en formation), 33 rue Vivienne, Paris; Etablissements Soulier, 25 rue Tous-Vents, Rouen; Etablissements Gabriel Wattelez, 94 rue Saint-Lazare, Paris and Wattelez et Cie, 172 avenue d'Argenteuil, Colombes (Seine).

Concerns that had prepared important exhibits of chemicals and compounding ingredients for the rubber industry included: Compagnie Lorraine de Charbons, Lampes et Appareillages Electriques, 56 rue du Faubourg-Saint-Honoré, Paris; G. Devineau, Etablissements, 26 rue Lafayette, Paris; Distillerie des Deux Sèvres, Melle (Deux-Sèvres); and Lescuyer et Villeneuve, Bléré (Indre-et-Loire).

United Kingdom

Reliance Rubber Co., Ltd., Formosa street and Amberly road, Paddington, London, W. 9. General sports wear and mechanical goods, and "Reliance" goods made by the company's "Vital" process, including hot-water bottles, ice-bags gloves, etc.

Northwestern Rubber Co., Litherland, Liverpool. Rubber reclaimed by the alkali process.

Charles Macintosh & Co., Ltd., 55 Pall Mall, S. W. 1. Mechanical rubber goods, molded goods, rubber footwear, ebonite articles, druggists' rubber sundries, etc.

James Ferguson & Sons, Ltd., Lea Park Works, London, S. W. 19. "Nestor" regenerated and shredded rubber, ebonite dust, and general compounding ingredients.

Henry Gardner & Co., Ltd., 2 Metal Exchange Buildings, Leadenhall avenue, London, E. C., with branches in Birmingham, Manchester, and New York, showed, under the trade name of "Atlas" many varieties of plantation rubber, latex, balata, gutta percha, and soling crepe.

Companies exhibiting chemicals and compounding ingredients for the rubber trade included The Western Chemical Co., Ltd., Sandyford Works, Paisley, Scotland; the Anchor Chemical Co., Ltd., Clayton, Manchester; and Chance & Hunt, Ltd., 5-7 St. Helens Place, London, E. C. 3.

Les Agences de la Maison W. Van Lede, 17 Place de la Madeline, Paris, and M. W. Van Lede displayed exhibits prepared by Francis Shaw & Co., Ltd., Bradford, Manchester, manufacturers of rubber machinery; The Western Chemical Co., Ltd., Sandyford Works, Paisley, Scotland, chemicals for the rubber trade; and the R. T. Vanderbilt Co., Inc., the United States Rubber Reclaiming Co., Inc., and Alfred Smith, the last three organizations specializing in the manufacture of rubber compounding ingredients.

The Rubber Growers' Association, Inc., 2, 3 and 4 Idol-lane, Eastcheap, London, E. C. 3, had on display the famous "Rubber House" fully equipped with rubber goods, and also a model hotel lounge, planned to show the decorative effects that could be produced by the use of rubber. Other attractive exhibits included rubberized fabrics in delicate colors, rubber footwear of various types, and also a number of articles made by the new process of electro-deposition on ebonite, the latter class of goods being shown for the first time.

Colonial and Other Exhibits

Italy's leading exhibit was that of Societa Italiana Pirelli, Via Fabio Filzi, 21, Milano, this including an effective display of all kinds of wire and cables, pneumatic and solid tires for all purposes, waterproofed garments and fabrics, and general lines of mechanical, surgical, and sanitary rubber goods.

Many of the colonial exhibits attracted much attention, while elaborate displays had also been prepared by the Belgian Congo, Brazil, British Malaya, and the Netherlands Indies, all intended to display the great resources of the tropics as they pertain to the rubber industry. It is believed that this year's Exhibition has been as a whole one of the most important and representative of the series.

Conference Addresses and Papers

Much interest was shown in the various papers read at the Conference sessions, the program including the following:

Opening addresses on January 24 by M. Painleve, Sir Wyndham Dunstan, Professor Perrot, and others. These were followed by papers by F. W. G. Rippon (Malaya), on "Estate Practice in Collection and Curing of Plantation Rubber"; B. J. Eaton (Malaya), on "Recent Problems of the Plantation Rubber Industry"; H. Ashplant (Southern India), on "Comparison of Planting Conditions in Different Countries."

On January 25, Dr. E. A. Hauser (Germany) read a paper on "Concentrated Latex and Its Industrial Use," followed by one prepared by E. Hopkinson (United States), the subject being "The Spray Process of Preparing Rubber from Latex." Other papers were read by M. M. Wavelet (France), on "The Advantages and Disadvantages of the Direct Employment of Latex in the Rubber Industry"; and Dr. H. P. Stevens (United Kingdom), on "New Methods and Modifications of Rubber Preparation."

R. A. Taylor (Ceylon) read on January 26 a paper on "Improvement of Stock by Propagation of High Yielding Trees," this being followed by papers on "Development of Methods of Obtaining Areas of Increased Productivity" and "Prospects of Rubber Production in the Amazon" by J. Grantham (Sumatra), and H. H. de Vasconcellos, respectively.

A joint paper dealing with "Some Technical Problems of the Rubber Industry" and prepared by Dr. S. Pickles (United Kingdom) and B. D. Porritt (United Kingdom) was the opening contribution to the program for January 27, this being followed by papers by Dr. P. Schidrowitz (United Kingdom), and M. J. Bongrand (France), the subjects being respectively "The Stabilization of Vulcanized Rubber," and "Tackiness in Rubber."

The last day of the Conference was one of the most important when the following subjects were discussed: "New Uses for Rubber," by Sir Stanley Bois (United Kingdom); "New Uses of Rubber in Paving Modern Roads," M. J. Bongrand (France), and "The Preservation of Fresh Fruit With Latex," W. Spoon (United Kingdom).

The Rubber Industry in Europe

Great Britain

Some interesting reviews of conditions in the rubber industry during the past year are now appearing, while the forecasts for 1927, although authorities may widely differ regarding them, are also of considerable value. In a careful and extended review of the 1926 market, Lloyd, Matheson & Carritt, crude rubber brokers, have made some noteworthy statements, from which the following may be quoted:

If the past year has been disappointing as regards consumption, it has at least made one or two matters clear, on which there has been much discussion. It has shown that the native production of the Netherlands East Indies is not the menace which it was at one time considered, since the output from that quarter for the past year is officially estimated by the Central Statistical Office at the Hague to be 20 per cent less than in 1925. The falling off is probably due to overtapping in the past. It has also given some fairly plain indications of the minimum to which the world's consumption of rubber can be reduced, and, on the other hand, of the maximum present output under conservative methods of tapping. The minimum consumption requirements may be reckoned at about 550,000 tons annually, while the maximum present production is in the neighborhood of 650,000 tons. The margin between these two figures must vary with the general prosperity, or otherwise, of the world. To insure some measure of stability, the rubber industry still requires assistance, as much in the interest of buyers as producers, and the new restriction scheme has been drawn up with that particular object in view.

The world's production during the last twelve months has shown an increase of a little more than 100,000 tons over that of 1925, or approximately 20 per cent. Of this larger quantity Malaya has accounted for about 79,000 tons and Ceylon for 11,000 tons. As regards the Dutch East Indian output, the increase is small and has all been harvested from European estates, the native output having actually shown a considerable decrease. From other parts of the world crops have remained about stationary, though rather more wild varieties have been available. The average increase in consumption, taken over a number of years, has been at the rate of about 11 per cent. When in any particular year it has been greater than this, the rate of increase in the following year has usually been smaller. Conversely, when the increase has been below normal, the average for the following year has been higher. In 1925 the increase amounted to nearly 24 per cent, and in 1926 to under one per cent. There should therefore be some improvement again during 1927.

During the coming year a rise in prices seems inevitable, though there may not be any substantial advance immediately. If our estimates of 595,000 tons for consumption and 570,000 tons for production are approximately correct, the difference of 25,000 tons can be made good only out of present stocks, which are none too large, having regard to present-day requirements. On a basis of 1926 consumption, our estimate of 570,000 tons for 1927 production would suffice for the world's requirements.

Institution of the Rubber Industry

The fifth annual dinner of the Institution of the Rubber Industry will take place on March 24 at the Connaught Rooms, London. Lord Colwyn, the president of the organization, will preside. On February 8 the Birmingham Section held its annual dinner at the Queen's Hotel, Birmingham, Colin Macbeth presiding. The occasion was especially planned as a means of bringing together the representatives of the rubber, motor, motorcycle, cycle, and allied industries.

At a meeting January 10 of the London Section, a paper was read by G. Martin, who took as his subject "The Aging of Raw and Vulcanized Rubber." The leading paper at a meeting of the Birmingham Section on January 6 was read by A. W. T. Hyde, "Physical Tests and Their Significance." A joint meeting of the members of the Institution of the Rubber Industry and the Society of Chemical Industry was held January 13 at St. Mary's Parsonage, Deansgate, Manchester, Dr. D. F. Twiss reading a paper on "Rubber Solvents."

Two papers were read at the meeting on February 7 of the London Section, one by H. Turner, who took as his subject "Set in Vulcanized Rubber," and the other by H. Standring, "Rubber Toys." J. Lloyd's paper at the session held in Manchester, February 10, was entitled "Proofing." Sir William Clark's subject at the London meeting February 21 was "Export Selling."

Stevenson Memorials Proposed

Two memorials to the late Sir James Stevenson, the sponsor of the British rubber restriction measure, are at present under consideration. One of these projects, which has the support of the Rubber Growers' Association, is the provision of a scholarship at the Loretto School, this opportunity being available to young men whose fathers have rendered distinguished public services. A fund for the establishment of this memorial has been organized at the Association's headquarters, 2 Idol-Lane, London, E.C. 3.

The second scheme contemplates the erection of a memorial in St. Paul's Cathedral, London, the project having the approval of the Dean and Chapter, and being under the patronage of such distinguished men as Messrs. Lloyd George, Winston Churchill, Amery, and others.

British Notes

The Goodyear Tire & Rubber Co. (Australia), Ltd., has issued a prospectus setting forth the company's plans for the establishment of a large factory in New South Wales. It is stated that the organization, capitalized at £1,200,000, has for its object the purchase of the entire business of the Goodyear Tire & Rubber Company of Australasia, Ltd., one of the parent company's distributing subsidiaries. An option has been secured over a block of twenty acres in Granville, and it is said that a modern factory building is to be erected where operations will be begun within twelve months. The products will include motor tires, inner tubes, and other rubber goods. The directors of the new organization will include James Kell; Paul W. Litchfield, president of the Goodyear Tire & Rubber Co. of America; and William G. Kither, managing director of the Goodyear Tire & Rubber Co. of Australasia.

The Expanded Rubber Co., Ltd., 38 Harlesden Road, London, N.W. 10, has purchased the site and permanent buildings formerly occupied by the Palace of Peace at the British Empire Exhibition, Wembley. The property includes about two acres of land, upon which a new plant is being erected for the development of "Onazote" products.

William Somerville's Sons Rubber Co., Ltd., 13 Castle street, Liverpool, is the direct selling agent in Great Britain for Grasselerator 808, an organic accelerator manufactured by The Grasselli Chemical Co., 347 Madison avenue, New York, N. Y.

B. D. W. Luff, author of "The Chemistry of Rubber," who for the past sixteen years has been connected with the North British Rubber Co., Ltd., Castle Mills, Edinburgh, is now manager of the analytical laboratories of Lever Bros., Port Sunlight, where he will supervise the work of a staff of seventy chemists. He will be succeeded at the North British Rubber works by J. A. Robertson. Another change made by the last-mentioned organization is the appointment of James Stanley Marshall as chief engineer, succeeding the late A. R. Woodhall.

H. Shankland has been appointed general sales manager of the Dunlop Rubber Co., Ltd., while H. L. Kenward, recently the company's regional sales manager for southern England, has been made assistant sales manager.

According to the *Motor Trader*, there has been a steady increase in the British production of passenger automobiles, the figures rising from a production in 1922 of 38,000 cars, value £20,500,000, to the total for 1926 of 158,699 cars, value £43,161,945. The 1926 figures represent a total volume increase over 1925 of 14 per cent.

Austria

The need for a **Government Rubber Institute** which would not only be devoted to research work and instruction, but would advise the rubber industry where necessary and function quite impartially, has been long felt in Austria.

The beneficial influence of such institutes on the individual branches of the industry, particularly as found in Germany, where such government foundations are considered to have contributed notably toward placing Germany in its leading industrial position, has led a number of Austrian rubber men to unite with the aim of inducing the government to establish a rubber research institute. A committee has been formed which is charged with securing the necessary support—moral and material—for the scheme.

Poland

The principal rubber factories in Poland are: the **Wolbrom Joint Stock Co.**, Wolbrom; the **Caoutchouc,** Bydgoszcz; the **Joint Stock Co.**, and the **Pneumatyk,** Posen; and the **Pepege,** Grudziadz. Besides these there are a few smaller factories. The lines manufactured are: bicycle, airplane, motorcycle, and automobile pneumatic tires and tubes; solid tires for automobiles; mechanical goods; sanitary and surgical goods, toys, footwear, and cement. The concerns, therefore, could easily supply the entire market. However, almost two-thirds of the Polish demand has to be met by foreign imports, production in 1925 having been 1,200 tons against imports of 1,908 tons. In 1924 the difference was even greater—production 1,000 tons, imports 2,025 tons.

Poland imported 412 tons of crude rubber in 1925 against 339 tons in 1924.

European Notes

During the first nine months of 1926, Italy imported 82,500 quintals of crude rubber, value 257,695,038 lire, as compared with 88,988 quintals, value 213,066,149 lire in 1925. At the same time, Italy exported tires and tubes to the amount of 72,371 quintals, value 281,289,259 lire, against 74,666 quintals, value 261,996,310 lire.

Société Congolaise du Caoutchouc, 47, rue Vivienne, Paris, France, has been formed to exploit rubber from rhizomes. The concern is capitalized at 1,200,000 francs.

Germany

It is learned that the **Gummiwerke Fulda A.-G.,** Fulda, and the **Deka-Pneumatik G. m. b. H.,** Berlin, subsidiary of the **Deutsche Kabelwerke A.-G.,** have formed a selling combine. From January 1 the sale of the products of both firms (except in Berlin and the province of Brandenburg) will take place exclusively through the branches of the Gummiwerke Fulda to be found in all the large cities of Germany. The Fulda A.-G. manufactures solid and extra elastic tires for motor trucks as well as bicycle tires and tubes. The Deka manufactures pneumatic tires for automobiles and motor cycles, so that the manufactures of the two concerns supplement each other and comprise all types of tires. Many advantages both to the firms concerned and users of their products are looked for from this union of interests.

Rubber Goods Bogy

Much indignation has been roused among all connected with the manufacture and sale of rubber nipples, teething-rings and toys, by a notice in the *Deutschen Krankenkassen Korrespondenz,* concerning the dangers hidden in these goods. The item in question resurrects some old bogies regarding the harmfulness of black and gray rubber nipples and toys, also similar articles decorated in colors, and advises purchasers to leave these severely alone and for safety's sake to buy only red or red-brown rubber goods.

All this of course is nonsense. The mixings intended for toys, nipples and other articles used in connection with feeding of infants have been regulated by government, and German rubber manufacturers keep to these regulations in their own interests, if for no other reason.

Weiss & Baessler's 40th Anniversary

The **Vulkan Gummiwarenfabrik Weiss & Baessler A.-G.,** Liepzig-Lindenau, is one of the leading rubber goods factories in Germany and its hard and soft rubber surgical goods as well as seamless articles are well-known both at home and abroad.

The firm was founded in 1886 by Julius Baessler and under the name of Julius Baessler & Co., took up the manufacture of surgical rubber goods and rubber nipples. But it was not until Herr Ernst Weiss entered the firm as partner in 1889 that real progress was made. From that time on, the concern which was reorganized and named Vulkan Gummiwarenfabrik Weiss & Baessler, made rapid strides forward, and before long, chiefly due to the initiative of Herr Ernst Weiss, the comparatively small firm had developed into one of the leading rubber concerns in Germany. In recognition of his services, Herr Weiss received the title Kommerzienrat (Commercial Councillor). This leader died a few years ago when the direction passed into the hands of his son-in-law, Senator Thiele, and Dr. Hesse.

The firm, which is now celebrating the 40th year of its existence, is popular with its employes as is seen from the fact that 16 have been with the firm 25 years, 8 over 30 years and 6 over 35 years.

The Peters Union A.-G., Frankfurt-am-Main reports net profits of 1,025,527.15 marks for the past business year. A dividend of 8 per cent was distributed. The firm has increased its capital to 9,000,000 marks. Business last year was satisfactory and during the current year sales continue to increase despite low prices and competition, both local and foreign.

The strike in the textile industry in the Wuppertal district has now extended to the rubber webbing factories. This is particularly regrettable for the elastic webbing factories, as business was going on satisfactorily and orders for export were on hand.

The Brunonia Gummi-Gesellschaft m. B. H., Braunschweig, was dissolved October 22, 1926, by agreement of the partners.

Sweden

Preliminary statistics for Sweden's rubber business during 1926 show that imports of crude rubber were 2,160,232 kilos during the year as compared with 1,717,133 kilos in 1925. Imports of manufactures of rubber included 191,718 kilos of footwear against 250,100 kilos the year before, besides 3,188,225 kilos of other rubber manufactures during 1926 instead of 3,565,723 kilos. In addition, articles of rubberized fabrics to the amount of 185,936 kilos were imported in 1926 as compared with 239,545 kilos in 1925.

It will be noted that whereas arrivals of crude rubber increased during 1926, imports of manufactures decreased rather markedly, particularly as regards footwear. Exports of footwear, however, jumped from 484,986 kilos in 1925 to 630,172 kilos in 1926. Shipments of waste and old rubber from Sweden amounted to 267,229 kilos in 1926 against 525,145 kilos in the preceding year.

The **Baltic India Rubber Works,** Quadrat, Riga, is actively pushing the sale of rubber footwear in neighboring countries, and has established distributing headquarters at Vienna. Quadrat rubber footwear has already appeared on the German market.

The Rubber Industry in the Far East

Malaya

In the *Rubber Supplement* of *The Straits Budget*, December 30, 1926, after discussing the effect of unused coupons, failure to handle which properly is considered largely responsible for the weak tone of the market, and stocks in London, A. W. Still stresses two points for producers. One is that the London market in certain respects is a danger to the industry and the other that individual companies, in the absence of a central selling system, should stand out as resolutely as possible for what they consider a fair price for spot or forward.

Referring to the first point he quotes the following from a well-known firm:

On the subject of speculation it is instructive to note that the turnover of rubber in London alone last year is computed at over 700,000 tons, a significant pointer to the enormous volume of paper transactions when it is considered that the total world's production for the year barely exceeded 500,000 tons, and that the London figure excludes all dealings in the American and eastern markets.

The writer adds that when prices were soaring toward the end of 1925 he pointed out that there was no real scarcity and that a reaction was inevitable. The firm quoted above further states that many outsiders entered into contracts to deliver "paper" rubber over the first half of 1926 and the forced liquidations from this source accentuated the fall in values which was to be expected when supplies were adjusted to requirements. Adopting the same line of argument, it may be inferred that present depressed prices no more reflect the real position of rubber than did the high quotations a year ago.

Regarding the second point, Mr. Still says that he would like to see European estates fixing their own rates for forward contracts by mutual agreement, and refusing to make contracts on lower terms. They would still have the open markets to sell in and current rates would stiffen when a bigger amount of real business was done in them. At the present time big buying interests with large quantities of rubber guaranteed them by forward contracts based on London prices, are in a position to depress these prices and to make other contracts at lower rates.

The Land Hunger

Examination of a number of company reports recently published shows that if the slump prevented the extension of new plantings and activities in this direction were limited even after prices had begun to recover, the rubber growers are attempting to make up for lost time now. Of 16 company reports studied, there were nine cases where application for grants of land from the government had been made, or where existing reserves were being planted up. In some instances reserves were being planted up but at the same time directors were on the look-out for more land.

In connection with the numerous applications for land, Mr. Peel, chief secretary, Federated Malay States, recently expressed himself in council as being rather astounded at what he termed the hectic striving for new large areas, and for rubber of all things. The government had been asked to continue a system of restriction to lessen output and prices had thereby somewhat improved. And now more rubber land was asked which he considered was like a cat chasing its own tail. Admitting that it was hard to prophesy what consumption would be in five or six years, he nevertheless recalled that Sir Frank Swettenham had warned against opening new areas.

Planting Activities

Kuala Muda Rubber Estates, Ltd., report profits of £120,998 for the year after adequate provision is made for depreciation of buildings and machinery. Dividends totaling 30 per cent were turned out for the year. The crop harvested was 1,256,269 pounds, and an average gross price of 2 shillings 10 pence was obtained. The crop for the current year, on the basis of 80 per cent of standard, is estimated at 1,768,016 pounds, which it is hoped will be produced at a cost of 7½ pence per pound, f. o. b. The planted area is to be extended to 7,043 acres by the addition of 850 acres, the clearing of which has already begun.

The Inch Kenneth Rubber Estates, Ltd., closed the year with profits of £23,367 against £9,594 the previous year. The crop harvested was 375,529 pounds produced at all-in cost of 1 shilling, 0.93 pence per pound against 11.82 pence last year, the increase being mainly due to higher labor rates. The gross average price obtained was 2 shillings 3.15 pence per pound. The company has a forward contract of 36 tons first stand crepe, expiring December 31, 1926, at 2 shillings 2 pence per pound.

The company's land is fully planted and application has been made to the government for a grant of land. Since the firm has been experimenting with bud grafting, seed selection, etc., it has a plentiful supply of material with which to plant up the new land according to latest approved methods.

The Narborough (F. M. S.) Rubber Estate, Ltd., turned out total dividends amounting to 25 per cent for the year. The f. o. b. cost worked out at 5.8 pence per pound, all-in costs being 7½ pence per pound. The estate is in excellent condition and the trees are exceptionally good yielders; the report for the month of August showed yields at the rate of 432 pounds per acre for the poorest field, up to 816 pounds at Narborough, and from 420 pounds up to 768 pounds per acre per annum at Sungei Taho.

These results have been obtained under normal conditions with conservative methods of tapping. In fact, crops are so good that even during the wintering months more than 100 per cent of the company's standard was produced although at the same time 225 acres were laid off. A further 55 acres of land are being opened and application has been made for another 1,200 acres.

The Kundong Rubber Estate, Ltd., is in the enviable position of being able to turn out total dividends amounting to 80 per cent. No forward contracts have been made for 1927 as the directors consider it bad business to do so at a time when forward prices are no higher and may prove much lower than the average spot market in 1927.

Malayan Notes

During the last week of December, 1926, Malaya suffered considerably due to abnormal floods throughout the country. The principal towns have been under 3 to 6 feet of water and many square miles of the chief tin mining areas have been flooded. Nor have rubber estates been immune. Indeed, tapping has had to stop entirely for over a week in some of the most productive districts and it is estimated that the loss in output is at least 50 per cent of what normally is produced in a month.

The scientific staff of the Rubber Growers' Association, which has been engaged in investigations in Malaya, with headquarters at Petaling Estate, Selangor, has been engaged by the Rubber Research Institute now in process of organization. As is known, Dr. Bryce is director of the Research Institute and it is hoped that under his direction Malaya will make the necessary headway in rubber research. Major B. J. Eaton, O. B. E., F. I. C., F. C. S., who has long been Agricultural Chemist in the Federated Malay States Government Department for Agriculture, will also give his services to the new Institute.

Netherlands East Indies

Native Rubber in Sumatra

In 1925 the local Department of Agriculture, Industry and Commerce instituted a series of investigations concerning native rubber, and reports covering Djambi, Southern and Eastern Division of Borneo, Western Division of Borneo and Palembang, have been issued. Now reports on native rubber in Tapanoeli, Western Sumatra, and Riouw and dependencies, East Coast Sumatra and Atjeh and dependencies have appeared.

Tapanoeli has an area of 38,888 square kilometers and a population of 839,515. The territory is mountainous and provided with good roads. The valleys are well watered and fertile. Hevea is planted everywhere at altitudes below 900 meters, and has become the most important crop in the district. In 1925, exports of native rubber came to 3,706 tons against 1,469 tons in 1923 and 1,851 tons in 1924.

The methods of preparation are primitive. The best quality is called sheety crepe, the higher grades of which are free of impurities and contain only 1 to 2 per cent of moisture. Other types, as Mandaling cakes, really strips 30 inches long, 9 inches wide and 1 inch thick, contain moisture and impurities amounting to 30 to 50 per cent. The lowest grades frequently contain less than 50 per cent of rubber. The best qualities (sheety crepe) amounting to about 40 per cent of the total native output, are shipped to Europe and America by European firms. The inferior grades are bought up by Chinese and native dealers and sent to Singapore for remilling purposes.

The firm of Becker & Brand is establishing a factory locally to work up inferior grades. The firm of Lam Chiong is also erecting a factory for the same purpose. Besides this there are plans for erecting a cooperative rubber factory by four owners of large plantations who will contract to supply latex to this factory exclusively.

Tapping methods are thoroughly bad, the bark being cut in a most reckless manner. Much disease is prevalent, a conservative estimate of the percentage of diseased trees being 73.29. This condition is due to bad tapping methods, negligence and close planting.

There has been extensive additional planting, but the labor situation effectually prevents full exploitation. However, since the younger generation of Bataks seems to be taking a liking to tapping and are becoming skilled in the art, the deficiency will probably be made up in the near future, and holders of plantings will not have to depend upon outside help to the extent they do now.

Native planting here is of comparatively recent date. It has undergone considerable extension in certain parts and the quality in some districts is very good. But it is doubtful whether native plantings will ever be as extensive as in Djambi and Palembang.

The total output of native rubber from this territory may be put at 1,000 tons for 1925.

Riouw and Dependencies

Production of native rubber in Riouw and dependencies is not very important. Of considerably greater interest is Indragiri, which exported about 7,000 tons of native rubber in 1925. While rubber from this district formerly was notorious for its poor quality—as late as 1923 loss after washing was about 50 per cent—it now exports the best quality of native rubber in all the Dutch East Indies. The greater part of the inferior grades are remilled locally by the Siap Ngian Rubber Works at Rengat. It is planned to erect a second factory at Tjerenti.

The Indragiri Highlands and the Kwantan districts are the chief rubber-producing territories here. The number of tappable trees is put at 5,000,000. Tapping methods are good, often very good, only bark consumption is rather high. There is not much disease and most of the holdings, about 75 per cent, are tapped by the owners. The new plantings are expected to come into bearing in 1929, 1930 and 1931, but increase in output will depend to a large extent upon the available supplies of labor.

East Coast of Sumatra

That part of East Coast of Sumatra embracing North-East Langkat and Bengkalis together with the adjoining portion of Asahan is the region where native rubber predominates. On the whole it is not expanding rapidly as the best lands are occupied by the big estates.

The quality of native rubber produced is very variable. Much of it is very good and much is the reverse. Tapping is rather careless and the holdings frequently shows signs of overtapping and hacking. In spite of this, comparatively little disease, except brown bast, was met with. Most new plantings have taken place after 1924, the chief extensions having been in Laboean Batoe and the Roka territory. Here too increase in output in 1929 will depend on the labor situation and the market price.

Selection and Diseases

Dr. C. J. J. van Hall, former director of the Institute for Plant Diseases, Buitenzorg, in a lecture held recently in Holland, drew attention to the fact that most of the rubber on eastern plantations is from inferior material, therefore the yield, quality, and resistance to disease is low.

For this reason, intensive cultivation of crops like rubber, coffee, tea, cocoa, etc., does not pay. The intrinsic value of one of these trees, more particularly of the latter three, is too low to permit spending much money on manures, treatment of diseases and the like, and such means of improving and preserving the trees are, therefore, used only to a limited extent.

As a result of this a new disease may kill off an entire industry, as was the case with certain types of coffee in Java and elsewhere, and with rubber leaf disease in the Guianas. In addition, since extensive cultivation is easy, natives are enabled to compete with European estates.

The remedy lies in so far improving trees by selection that it pays to take proper care of them and to gather the experience necessary effectually to hold down pests and diseases. A certain amount of work has been done in connection with the selection of Heveas, but when the vast amount of work still to be done in this direction is contemplated it will readily be seen that as yet the surface has only been scratched and that if present efforts are to be of any value at all, all hands must take up the task with the utmost energy and experiment stations must be aided so that the work may be carried forward on as large a scale and as rapidly as possible.

Netherlands East Indies Notes

The Central Bureau for statistics announces that the total output of the entire Netherlands East Indies during 1926 was 209,000 tons against 194,034 tons the year before. The share of the native production in this was 85,000 tons dry against 87,987 in 1925. Apparently native rubber outputs caught up again to a certain extent during the latter part of the year, for estimates based on monthly shipments and published some months ago put the total native crop at 70,000 to 75,000 tons.

It is reported that the fiscal authorities in Dutch East Indies have doubled the percentage which may be written off annually against the original value of rubber estates. Up to now, the authorities have held that 2 per cent was enough. Rubber planters continually agitated for a higher percentage, claiming that this was too low, the Rubber Cultuur Mij, Amsterdam, being particularly active in this connection. It now appears that these efforts have finally succeeded, and that rubber concerns may henceforth write off 4 per cent of the book value of their estates per annum.

Rubber Patents, Trade Marks and Designs

United States

January 18, 1927*

1,614,853 Tennis ball. Louis Schwartz, New York, N. Y.
1,614,915 Life saving device. Cornelius J. Carey, Fall River, Massachusetts.
1,614,994 Adjustable pneumatic horse collar. Herman H. Ruedebusch, Elkton, South Dakota.
1,615,007 Heel. Joseph B. Falvo, Detroit, Michigan.
1,615,016 Valve. Herman T. Kraft, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.

January 25, 1927*

1,615,270 Mechanism for heel attachment. John B. Hadaway, Swampscott, Massachusetts, assignor to United Shoe Machinery Corporation, Paterson, New Jersey.
1,615,634 Apparel garment. Waldemar Kops, New York, N. Y., assignor to Kops Brothers, Inc., a corporation of New York.
1,615,765 Cream removing device. Andrew T. Laws, St. Helens, Oregon.

February 1, 1927*

1,615,915 Windshield cleaner. William F. Ridge, Akron, Ohio.
1,615,954 Swimming device. George B. Nichols, Akron, Ohio.
1,616,009 Door pocket strap. William S. Turner, Detroit, Michigan, assignor to The Paine & Williams Co., Cleveland, Ohio.
1,616,026 Resilient tire. John Henry Burns, Brisbane, Queensland, Australia.
1,616,116 Protective covering for gasoline tanks. Marquis de Salamanca, Madrid, Spain, assignod to Société Electromecanique d'Appareillage pour l'Essence, Bois-Colombes, France.
1,616,190 Fastening means. Morris Kosofsky, assignor to Kenilworth Manufacturing Co., Inc., both of New York, N. Y.
1,616,293 Vehicle tire. Charles A. Wolfe, Lebanon, Pennsylvania.
1,616,389 Vaginal syringe. George F. Piercy, Superior, Nebraska.

February 8, 1927*

1,616,483 Toy rubber shooter. Harry E. Bell, Fort Worth, Texas.
1,616,543 Tire casing. Omoto Bunnosuke, Green River, Wyoming.
1,616,654 Electric coupling. John R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.
1,616,664 Combined hollow rubber toy and sound emission device. Frederick J. Maywald, Rutherford, New Jersey.
1,616,843 Cushion tire. William A. Brubaker, Akron, Ohio.
1,616,961 Neck bag. Howard G. Carter, Detroit, Michigan.
1,617,011 Advertising balloon. James F. Cooper, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.
1,617,233 Golf tee. Chilton E. Byington, Chattanooga, Tennessee.
1,617,243 Battledore. Thomas Flanagan, Rochester, New York.
1,617,306 Suspenders. Arthur E. Pellerin, Standish, New York.

Dominion of Canada

January 11, 1927

267,379 Container valve. James Francis and William Thomas Barnes, both of Hawthorn, Victoria, Australia.
267,385 Cushion wheel. Nathan Abramson, Lafayette, Louisiana, U. S. A.
267,398 Washer feeder. Edward Bruce Carter, Boston, Massachusetts, U. S. A.
267,430 Powder puff closure. George S. Hershey, Los Angeles, California, U. S. A.
267,459 Tire. Frank Dyson Smith, Wellington, New Zealand.
267,547 Elastic fabric. Joseph Siegel, Detroit, Michigan, U. S. A.

January 18, 1927

267,652 Garter. Katherine A. Thompson, Milwaukee, Wisconsin, U. S. A.
267,691 Radiator hose. The Continental Rubber Works, assignee of Paul H. Henkel, both of Erie, Pennsylvania, U. S. A.

January 25, 1927

267,834 Solid tire. Michael Murphy, Saskatoon, Saskatchewan.
267,922 Dishwasher cover. The Kohler Co., assignee of Frank G. Brotz, both of Kohler, Wisconsin, U. S. A.
267,929 Pneumatic cushion, bed, etc. David Moseley & Sons, Ltd., assignee of Reginald Moseley, both of Manchester, Lancaster, England.
267,946 Heel. The United Shoe Machinery Co. of Canada, Ltd., Montreal, Quebec, assignee of John Benjamin Hadaway, Swampscott, Massachusetts, U. S. A.
267,964 Finger stall. Berthold Monasch, Leipzig, Saxony, assignee of Leopold Danin, Freiburg, Breisgau, both in Germany.

February 1, 1927

267,998 Nursing bottle with rubber top. Marion Gustine Clarke, New Orleans, Louisiana, U. S. A.
268,066 Shock unit for furniture legs. James Herbert Stedman, Braintree, Massachusetts, U. S. A.
268,113 Machinery belt. The Goodyear Tire & Rubber Co., assignee of Austin A. Teisher, both of Akron, Ohio.
268,115 Container. The Goodyear Tire & Rubber Co., assignee of Ralph W. Sohl, both of Akron, Ohio.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

February 8, 1927

268,217 Cushion tire. Robert McMullan, Inglewood, Western Australia, Australia.

United Kindom

December 31, 1926

260,961† Single tube tire. H. Linwood, 109 Buchanan street, San Francisco, California, U. S. A.
260,979† Hair curler. E. Völkel, 16, V. Mittersteig, Vienna.
260,980† Ladder feet non-slipping devices. E. G. Hearn, 1 Rue Beaucourt Decourchelles, Lille, France.
261,004† Gaiters. Neue Gummigamaschen Ges., 100 Wilhelmstrasse, Berlin, assignee of A. Korting, 1 Grabenstrasse, Lichterfelde, both in Germany.
261,005† Gaiters. Neue Gummigamaschen Ges., 100 Wilhelmstrasse, Berlin, assignee of A. Korting, 1 Grabenstrasse, Lichterfelde, both in Germany.
261,023† Laminar springs. Motor Soc. Anon., 4 Rue Chaptel, Levallois Perret, assignee of E. Albisser, both of Seine, France.
261,036† Actuating diaphragms. Westinghouse Brake & Saxby Signal Co., Ltd., 82, York Road, King's Cross, London, assignee of C. S. Kelley, East McKeesport, Pennsylvania, U. S. A.
261,101 Golf tee. F. B. Hollis, 2, Blakesley avenue, Ealing, London.
261,120 Artificial dentures. N. Rose, 35, Bloomfield Road, Paddington, London.
261,198 Catamenial appliance. A. H. Ashworth, 25 West 68th street, New York, N. Y., U. S. A.
261,207 Rubber covered pulleys. C. W. Taylor, 326, Broadway, Hendon, and R. C. L. Corry, 12, Cranley Gardens, South Kensington, both in London.

January 12, 1927

261,311 Cycle pedals. E. W. Moss, 75, Victoria street, Westminster, and H. W. Peace, 76 Pine Crest Road, and J. W. Gibson, 590, Indian Road, both in Toronto, Canada.
261,389† Dress suspender grips. H. Holdsworth, 10, Pasture Road, Harehills, Leeds.
261,408† Massage appliance. J. Freiss, 26 Place Chauderon, Lausanne, Switzerland.
261,427† Sack and like bags. Felten & Guilleaume Carlswerk Akt.-Ges., Mülheim, Cologne, Germany.
261,452 Renewable horseshoe treads. J. Healy, 70, Lowbourne, Melksham, Wiltshire.
261,469 Laminated driving belt. Gandy Belt Manufacturing Co., Ltd., Wheatland Works, Wheatland Lane, Seacombe, and C. H. Probert, Marlowe Road, Wallasey, both in Cheshire.
261,470 Respirators. C. L. Burdick, 4, Eastern Road, Wood Green, London.
261,478 Paving blocks. J. H. Gath, Horton Works, Horton street, Halifax, Yorkshire.
261,480 Suction appliances for use in making dentures. N. Rose, 35, Bloomfield Road, Paddington, London.
261,511 Head rest. V. W. Holmes, 29, Welbeck street, London.
261,608 Goloshes and gaiters. W. M. Urbanek, 8 Rotdornstrasse, Friedenau, Berlin, Germany.
261,614 Punching ball. G. Weiss, 14 Innsbruckerstrasse, Schöneberg, Berlin, and W. Von Chamier-Glisczinski, 68 Bahnhofstrasse, Cotthus, both in Germany.
261,666 Armored rubber pipes. F. and K. Ebel, trading as W. Kux Nachf, 2 Bleichstrasse, Halberstadt, Germany.
261,703 Tire jackets and covers. R. Schäfer, 45 Endelstrasse, Magdeburg, Germany.

January 19, 1927

261,834 Bathing caps. E. D. Abbott, 95, Wickham Road, Brockley, London.
261,901 Spring wheels. T. G. Greenwood, 11, Pedder street, Morecambe, Lancashire.
261,902 Massage appliance. E. H. Bredenberg, 1, Seymour Road, Hampton Hill, Middlesex.
261,948 Rubber sucker for supporting articles on glass surface. H. Panzetta, 14, Lynwood Road, Redhill, Surrey.
261,983 Electric hair brush. R. A. Shortland, 10, New Brown street, Manchester.
262,022 Bathing shoes. E. S. Ward, 4732 Collinwood avenue, Fort Worth, Texas.
262,023 Removable cover for seat. H. A. Herzog, 5 Voltastrasse, Nuremburg, and K. H. Wisbrock, 24 Sternbergstrasse, Regensberg, both in Bavaria, Germany.

January 26, 1927

262,111† Tobacco pipe cleaner. E. Von Arx, Olten, Switzerland.
262,151† Spring wheel. J. Cooper, Terry Road Ryde, New South Wales, Australia.
262,175 Heel. British United Shoe Machinery Co., Ltd., and W. R. Barclay, Union Works, Belgrave Road, Leicester.
262,210 Book rest. D. A. Palmer, Shernbourne, Grove Park, Wanstead, Essex.
262,226 Thermionic valve holder. J. C. Ecclestone, 15, Gwynne Road, Dovercourt, Essex.

†Not yet accepted.

Chemical patents will be found on page 328. Machinery and Process Patents on pages 333-334.

262,261 Coil supports. J. B. Murray, 1250 Atlantic avenue, Brooklyn, N. Y.
262,307 Elastic strip for riding breeches. B. F. H. and H. W. T. Huntsman, 11, Saville Row, London.
262,324 Top boot with elastic insert. W. A. Tompkins, Mansfield street, Leicester.
262,347 Broom with squeegee. D. Jenkins, 7, Quay street, Cardiff.

New Zealand

December 16, 1926

57,405 Auxiliary bearing springs. George Spencer Moulton & Co., Ltd., and Charles William Cresswell Hine, both of 2, Central buildings, Westminster, London, S. W. 1, England.

Germany

439,415 Rubber membrane as partition for primary and secondary elements in electrolytic cells, filters, etc. Dr. Hermann Beckmann, Albertinenstrasse 26, Berlin-Zehlendorf.
439,814 Inhaling apparatus. Carl Ferdinand Otto Muller, Wendtstrasse 5, Karlsruhe, Baden.
439,859 Hollow rubber inner ball. The Dunlop Rubber Co., Ltd., London. Represented by Dr. R. Wirth, C. Weihe, Dr. H. Weil, M. M. Wirth, Frankfort-am-Main, and T. R. Koehnhorn and C. Noll, Berlin S. W. 11.

Trade Marks

United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the later act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

January 18, 1927, Act of February 20, 1905

223,144 Fancy design containing the word: "Hood"—pneumatic and cushion tires and tubes. Hood Rubber Co., Watertown, Massachusetts.
223,168 Handy-Andy—tire and tube repair kits and tire patching materials. The Miller Rubber Co., Akron, Ohio.
223,184 Crusader—tires and tubes. Sears, Roebuck & Co., Chicago, Illinois.
223,196 Double circle containing the representation of two crossed mallets—crude rubber, vegetable gums, balata and gutta percha. Henry Gardner, Guiterman & Co., Inc., New York, N. Y.

January 25, 1927, Act of March 19, 1920

223,275 Tripleservice—brake and transmission linings. Durwyllan Co., Inc., Paterson, New Jersey.
223,278 Fulcircul—retread tire molds. Mark H. Gregg, doing business as Gregg Co., Oakland, California.
223,284 Sta-tite—hand stamps. Franklin Printing Co., Inc., Tampa, Florida.
223,289 International Registration No. 1,202 of November 19, 1926. Representation of circle on which a parrot is swinging; above the representation of the parrot the word: "Parrot," beneath the representation of the circle the word: "Shoes"—heels, shoes, etc. Manuel Fernández Gonzáles, cesionario de Manuel Crespo Mendez, Manzana de Gómez, 229, Habana, Cuba.

February 1, 1927, Act of February 20, 1905

223,315 The Alligator Self-Vulco Boots—boot for use in repairing tire casings. Ray L. Peugh, Oklahoma City, Oklahoma.
223,414 Everub—erasers. Nils T. Trygge, Chicago, Illinois.
223,419 Representation of a heart in the center of which is the word: "Ace"—blowout patches or boots for pneumatic tires and cold patches for tires and tubes. Rubber Products Co., Inc., Fort Worth, Texas.
223,421 Northern—rubber, fabric or rubber and fabric hose. Eureka Fire Hose Manufacturing Co., New York, N. Y.
223,462 Agalite—pulp used in the preparation of rubber soap, etc. Union Talc Co., Gouverneur, New York.

February 1, 1927, Act of March 19, 1920

223,504 Parisian Hosiery Mudguard—waterproof stocking protectors. August P. Lauster, Brooklyn, New York.
223,509 Insulator Hood—devices for protecting linemen. W. H. Salisbury & Co., Inc., Chicago, Illinois.
223,510 Line Hose—devices for protecting linemen. W. H. Salisbury & Co., Inc., Chicago, Illinois.
223,511 Fanciful design employing the words: "John Wanamaker The Arch-Support Shoe Philadelphia"—shoes. John Wanamaker Philadelphia, Philadelphia, Pennsylvania.
223,530 Liberian—tires. Racine Horseshoe Tire Co., Racine, Wisconsin.
223,535 Inlaid Fibre—vulcanized fiber. Diamond State Fibre Co., Bridgeport, Pennsylvania.

February 8, 1927, Act of February 20, 1905

223,562 Fancy square at the top of which are the words: "Junior-Prep"—raincoats, etc. The J. L. Hudson Co., Detroit, Michigan.
223,576 Polo—garters. A. Stein & Co., Chicago, Illinois.
223,580 Cascade—men's raincoats. Michaels Stern & Co., Rochester, New York.
223,582 The word: "Silverette" with the letter: "E" elongated to form a pennant beneath the word—raincoats. Weil Clothing Co., St. Louis, Missouri.
223,586 Odd-A-Step—combined step-in and sanitary apron. Odd-A-Shoppe, Inc., New York, N. Y.
223,603 Pumpettes—ladies' overshoes. The Miller Rubber Co., Akron, Ohio.
223,630 The word: "Nu-Way" enclosed in a fancy oblong—elastic shoulder straps, bias binding, etc. Bartons Bias Narrow Fabric Co., Bridgeport, Connecticut, and New York, N. Y.
223,633 Representation of a heel across which is superimposed the word: "Rubberkap"—shoes of leather and rubber. Morris A. Feinstein, Chicago, Illinois.
223,676 Emblem—tires and tubes. Sears, Roebuck & Co., Chicago, Illinois.
223,677 Essar Cord—tires and tubes. Sears, Roebuck & Co., Chicago, Illinois.
223,678 Honor-Bilt—tires and tubes. Sears, Roebuck & Co., Chicago, Illinois.
223,679 Sincerity—tires and tubes. Sears, Roebuck & Co., Chicago, Illinois.
223,697 Captax—accelerators for the vulcanization of caoutchouc. The Goodyear Tire & Rubber Co., Akron, Ohio.
223,721 Oblong containing the words: "Travelane Modes New York"—leather, rubber and fabric shoes, etc. M. Gerla & Son, New York, N. Y.
223,734 JemCo—boots and shoes of leather, rubber, canvas, etc. Jordan Marsh Co., Boston, Massachusetts.
223,763 Dauntless—tires and tubes. Sears, Roebuck & Co., Chicago, Illinois.
223,773 All-States—tires and tubes. Sears, Roebuck & Co., Chicago, Illinois.
223,815 Representation of a ship—cushions and mattresses. Airubber Corporation, Chicago, Illinois.
223,816 Airubber—cushions and mattresses. Airubber Corporation, Chicago, Illinois.

February 8, 1927, Act of March 19, 1920

223,833 Safe-Gard—catamenial garments. Byrdie R. Kessler, New York, N. Y.

Dominion of Canada

Registered

January 18, 1927

40,974 Blue patch of oblate octagonal form, having a raised border, and bearing in raised lettering the word: "Rhino," the size of the lettering being such that the outline of the word as a whole substantially conforms to the shape of the adjacent sides of the patch—rubber and gutta percha articles. Canadian Goodrich Co., Ltd., Kitchener, Ontario.
40,981 Word: "Excello" and the representation of a wreath surrounding the same—raincoats, rubber goods, etc. Excello Rubber Co., Inc., New York, N. Y., U. S. A.
40,982 Words: "Golden Rule"—boots, shoes and slippers. James M. Daly, Swampscott, Massachusetts, U. S. A.
40,996 Word: "Renown"—rubbers, etc. The T. Eaton Co., Ltd., Toronto, Ontario and Winnipeg, Manitoba.
40,997 Word: "Canterbury"—rubbers, etc. The T. Eaton Co., Ltd., Toronto, Ontario, and Winnipeg, Manitoba.

February 1, 1927

41,035 Picture of a runner—soles and heels for boots and shoes. Marathon Rubber Co., Inc., Akron, Ohio.
41,036 Word: "Marathon," the syllables "Mara" and "thon" being separated by a picture of a runner—boots, shoes, heels and soles. Marathon Rubber Co., Inc., Akron, Ohio, U. S. A.
41,037 Word: "Marathon," the syllables of which are separated by the figure of a conventional Marathon runner—tires and tubes. Marathon Rubber Co., Inc., Akron, Ohio, U. S. A.

February 8, 1927

41,081 Word: "Birdie"—golf balls. St. Mungo Manufacturing Co., Ltd., 185 Broom-loan Road, Glasgow, Scotland.

United Kingdom

January 5, 1927

474,867 "Witchan"—rubber goods. Whitby & Chandler, Ltd., 30, The Wicker, Sheffield.

January 12, 1927

473,667 Vacme—rubber closures for tumblers, cups, jars, etc. Atco, Ltd., Tudor Works, Clevedon Road, East Twickenham, Middlesex.
474,437 Dela—boots, shoes, slippers, leggings and gaiters. The Dela Rubber Shoe Co., Ltd., 2, Cambridge street, Manchester.
474,440 Delastorm—boots, shoes, slippers, leggings and gaiters. The Dela Rubber Shoe Co., Ltd., 2, Cambridge street, Manchester.
474,441 Delashield—boots, shoes, slippers, leggings and gaiters. The Dela Rubber Shoe Co., Ltd., 2, Cambridge street, Manchester.
474,442 Delasnow—boots, shoes, slippers, leggings and gaiters. The Dela Rubber Shoe Co., Ltd., 2, Cambridge street, Manchester.
474,443 Delawear—boots, shoes, slippers, leggings and gaiters. The Dela Rubber Shoe Co., Ltd., 2, Cambridge street, Manchester.
474,444 Delasport—boots, shoes, slippers, leggings and gaiters. The Dela Rubber Shoe Co., Ltd., 2, Cambridge street, Manchester.
474,445 Delastrand—boots, shoes, slippers, leggings and gaiters. The Dela Rubber Shoe Co., Ltd., 2, Cambridge street, Manchester.
474,446 Delaguard—boots, shoes, slippers, leggings and gaiters. The Dela Rubber Shoe Co., Ltd., 2, Cambridge street, Manchester.
474,561 Era—boots and shoes. The Goodyear Tire & Rubber Co., 1144 East Market street, Akron, Ohio, U. S. A. (Mewburn, Ellis & Co., 70-72 Chancery Lane, London, W. C. 2.)
475,212 Vida—elastic sandallings, webs, cords and laces. Jones, Stroud & Co., Ltd., Austin's Factory, Market Place, Long Eaton, Derbyshire.
475,213 Myra—elastic sandallings, webs, cords and laces. Jones, Stroud & Co., Ltd., Austin's Factory, Market Place, Long Eaton, Derbyshire.
475,214 Joan—elastic sandallings, webs, cords and laces. Jones, Stroud & Co., Ltd., Austin's Factory, Market Place, Long Eaton, Derbyshire.
475,215 Signus—elastic sandallings, webs, cords and laces. Jones, Stroud

& Co., Ltd., Austin's Factory, Market Place, Long Eaton, Derbyshire.

475,275 MINSTER—rubber and canvas machine belting. Eugene William Coulson, trading as E. W. Coulson & Coy, 22, Billiter street, London, E. C. 3.

January 19, 1927

472,994 ZIPPS—clothing. British Goodrich Rubber Co., Ltd., 50, Pall Mall, London, S. W. 1.

474,049 LIDOL—boots, shoes, slippers, leggings, gaiters and socks. Thomas H. Walker, Ltd., 8-10 Union street, Bradford, Yorkshire.

474,263 WINNER—heels, tips, soles and pads. North Kent Rubber Co., 26, Kingsland Road, London, E. 2.

474,921 DELADIP—boots, shoes, slippers, leggings and gaiters. The Dela Rubber Co., Ltd., 2, Cambridge street, Manchester.

475,273 DEFIANCE—heels, tips, soles and pads. North Kent Rubber Co., 26, Kingsland Road, London, E. 2.

475,805 Representation of a salamander in the background of which is outlined in dots the word: "SALAMANDER"—gloves. H. C. North & Co., Ltd., 42, Southwark street, London, S. E. 1.

January 26, 1927

135,148 SUNSHEEN—dress shields, etc. Raysheen, Ltd., 43, Castle street, Liverpool.

469,795 PARADURA—asphalts and compositions embodying asphalt and like bituminous material for use in manufacturing rubber belting, wire covered tires and the like goods. H. H. Robertson Co., Pittsburgh, Pennsylvania, U. S. A.

473,882 ZIPPER—clothing. British Goodrich Rubber Co., Ltd., 50, Pall Mall, London, S. W. 1.

Designs

United States

71,906 Tire. Term 14 years. Perry O. Chambers, assignor to The Akron Standard Mold Co., both of Akron, Ohio.

71,921 Tire. Term 14 years. Albert S. Michelson, assignor to The Akron Rubber Mold & Machine Co., both of Akron, Ohio.

71,986 Tire tread. Term 14 years. Harold D. Reichard, assignor to Racine Horseshoe Tire Co., both of Racine, Wisconsin.

71,992 Tire tread. Term 14 years. Harold D. Reichard, assignor to Racine Horseshoe Tire Co., both of Racine, Wisconsin.

Dominion of Canada

7,382 Rubber composition sheet material for soles and heels of footwear. Dominion Rubber Co., Ltd., Montreal, Quebec.

7,389 Tire tread. Gutta Percha & Rubber, Ltd., Toronto, Ontario.

7,390 Tire tread. Gutta Percha & Rubber, Ltd., Toronto, Ontario.

7,391 Tire. Michelin et Cie, Société en Commandite Par Actions, Clermont-Ferrand, France.

7,392 Tire. Michelin et Cie, Société en Commandite Par Actions, Clermont-Ferrand, France.

Germany

972,906 Toy airplane with rubber motor. Hugo Julius Schulze, Neusser Wall 42, Cologne.

973,760 Inflatable skittles figure. Kölnische Gummifäden-Fabrik vorm. Ferd. Kohlstadt & Co., Köln-Deutz.

973,930 Rubber cord with spun textile cover. Paul Hahn, Müllerstrasse 90, Berlin.

973,936 Rubber teeth. Sachsland Gummiwarenfabrik, Bürgel in Thuringia.

974,009 Sponge rubber corner for knee supports of operating chairs. Harburger Gummiwaren-Fabrik Phoenix A.-G., Harburg a. E.

974,051 Double texture rubberized fabric. Wilhelm Hoeber, Marschallstrasse 8, Chemnitz.

974,169 Motor vehicle foot rest. Haguma Hannoversche Gummiersatz Fabrik G. m. b. H., Hannover-Ricklingen.

974,524 Anti-slipping rubber heel. Richard Graubart, Innsbruck. Represented by O. Tomschik, Schicklerstrasse 6, Berlin.

974,872 Towel rail support with rubber insets. Türger & Lurmann, Iserlohn.

Prints

United States

9,438 CLARK'S DOLLAR STORE. Dress shields. Albert J. Clark, doing business as Clark's Dollar Store, Los Angeles, California. Published June 1, 1926.

SPANISH TIRE IMPORTS

Tire imports into Spain during the year 1926 totaled in value, according to the Department of Commerce 25,000,000 pesetas as against 17,000,000 pesetas for the year previous. The share of the United States in this trade of 1926 was approximately 6,000,000 pesetas and that of France 10,000,000 pesetas. In 1925, the imports from France were estimated at 7,000,000 pesetas, and those from the United States at about 3,000,000 pesetas. The value of the peseta is approximately $0.1606.

Statistics Compiled from Questionnaire Covering the Fourth Quarter of 1926

RECLAIMED RUBBER	Long Tons: Inventory at End of Quarter	Production	Shipments	Consumption
Reclaimers solely (7)	3,014	18,243	17,208	117
Manufacturers who also reclaim (24)	9,234	26,746	7,562	18,518
Other manufacturers (63)	5,912	.....	.....	11,661
Totals	18,160	44,989	24,770	30,296

SCRAP RUBBER	Long Tons: Inventory at End of Quarter	Consumption in Manufacture Reclaimed	Due on Contract at End of Quarter
Reclaimers solely (7)	38,134	33,124	9,650
Manufacturers who also reclaim (21)	26,150	25,286	11,401
Other manufacturers (19	1,685	.....	.....
Totals	65,969	58,410	21,051

Number of Tons of Crude Rubber Consumed in the Manufacture of Rubber Products and Total Sales Value of Shipments of Manufactured Rubber Products

PRODUCTS	Number of Tons of Crude Rubber Used	Total Sales Value of Shipments of Manufactured Rubber Products
Tires and Tire Sundries:		
Automobile and motor truck pneumatic casings	48,300	$140,754,000
Automobile and motor truck pneumatic tubes	11,212	23,523,000
Motorcycle tires (casings and tubes)	83	440,000
Bicycle tires (single tubes, casings and tubes)	225	891,000
All other pneumatic casings and tubes not elsewhere specified	...	113,000
Solid tires for motor vehicles	3,685	7,784,000
All other solid tires	57	209,000
Tire sundries and repair materials	1,329	4,995,000
Totals	64,891	$178,709,000
Other Rubber Products:		
Mechanical rubber goods	3,602	$23,135,000
Boots and shoes	3,673	37,888,000
Insulated wire and insulating compounds	685	7,471,000
Druggists' sundries, medical and surgical rubber goods	604	3,049,000
Waterproof cloth, clothing and rubber sheeting	744	6,255,000
Hard rubber goods	228	3,130,000
Heels and soles	915	4,982,000
Rubber flooring	205	1,244,000
Miscellaneous, not included in any of the above items	1,008	5,076,000
Totals	11,664	$92,230,000
Grand totals—all products	76,555	$270,939,000

Inventory of Crude Rubber in the United States and Afloat for United States Ports

ON HAND	Long Tons: Plantation	Pará	All Other	Totals
Manufacturers	55,055	1,710	2,020	58,785
Importers and dealers	7,655	1,321	1,115	10,091
Totals on hand	62,710	3,031	3,135	68,876
AFLOAT				
Manufacturers	18,057	582	....	18,639
Importers and dealers	30,358	943	589	31,891
Totals afloat	48,415	1,525	589	50,529

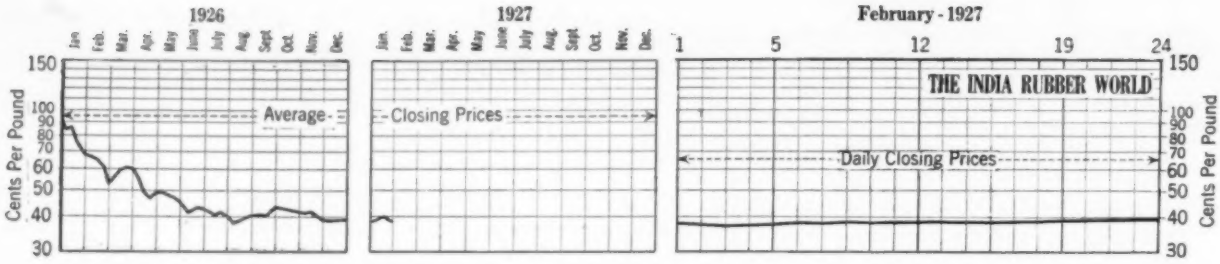
[1] Number of rubber manufacturers that reported data was 183; crude rubber importers and dealers, 41; reclaimers (solely), 8; total daily average number of employes on basis of third week of October, 1926, was 151,207.

It is estimated that the crude rubber consumption figures are *92 per cent of the total, and the crude rubber inventory 95 per cent of the total for the entire industry.

* Based on survey made by the Department of Commerce for the first six months of 1925.

AMERICAN EXPORTS OF RUBBER BELTING INCREASE

During the past three years there has been a steady increase in American exports of rubber belting, according to compilations prepared by the Department of Commerce. In 1924 the amount shipped totaled 3,572,255 pounds, the figure rising to 4,078,651 for 1925, and 4,175,810 pounds for 1926. Chile now holds the leading place as an importer of this class of goods, taking in 1924, 415,576 pounds; in 1925, 315,732 pounds, and in 1926, 584,052 pounds. Mexico's totals are as follows: 1924, 419,866 pounds; 1925, 499,443; and 1926, 386,296 pounds. Other important customers are in the following order: Canada, British South Africa, the United Kingdom, Australia, Belgium, the Philippines, Brazil and Argentina.



Ratio Graph of New York Closing Prices of Spot Ribbed Smoked Sheets

Review of the Crude Rubber Market

New York Outside Market

THE crude rubber market in February was as dull and featureless as that in January. The average spot price for ribs for the week ended January 29 was 38.1 cents. On February 1 spot was 37⅞ cents and from that level gradually advancing in the following three weeks by one cent, registering on February 19 38⅞ cents. Two national holidays contributed somewhat to slowing up business. Factory interest throughout the month was scattered and limited to small nearby filling-in lots. The average price of spot ribs in January was 39 cents and for the first three weeks of February was 37.9 cents. Most of this decline occurred in the first two weeks of the month. The latter half of the month showed a stronger tendency of the price to advance. On February 24 spot ribs were 39¼ cents sellers. First latex was consistently ¼ to ½-cent over ribs for the entire month.

A further restriction to 70 per cent in the exportable allowance took effect for the quarter beginning February 1. It is estimated by the rubber trade that this reduction will lessen shipments from British plantations about 10,000 tons. Owing to the statistical position of rubber, manufacturers feel no uneasiness as to ample supplies for their needs.

The week ended January 29 was very dull. A few factories made inquiries at prices below the market and a few sales were made of small lots of nearby rubber. The price was steady for the first two days of the week, then eased off ½ to ¾-cent and looked very weak. The market then strengthened by pool support and factory interest disappeared. Eastern markets were higher than New York. Paras were quiet in sympathy and balatas were neglected. On January 24 spot ribs were 38¼ cents, buyers, 38½ cents sellers.

During the week ended February 5 the market was practically dormant for the entire period. Scattered inquiries from factories continued for nearby rubber. Buyers and sellers were watching the market for developments. The East offered but little rubber and was not inclined to cut prices. All factory bids were low. Paras were quiet and lower. Balatas were easy but in no demand. On February 5, spot was 37½ cents, buyers, and 37¾ cents, sellers.

The market of the week ended February 12, was again extremely quiet with very narrow prices fluctuations. There was some scattered buying by factories of nearby small lots as in the two preceding weeks. Far Eastern prices became firmer at higher levels than in New York. Rubber being held in strong hands made trading difficult. Dealers were waiting out the market and had no incentive to sell. As spring advances better demand is expected. Paras were quiet and inquiries were few. Balatas were very quiet without demand. On February 7 ribs were 37½ cents, buyers; 37¾ cents, sellers. On February 11 they were 37¾ cents, buyers; 38 cents, sellers.

The week ended February 19, the market opened quiet but showed some life on Thursday. New York prices moved upward Friday with those in London where the advance was ⅛ pence, closing steady and dealers holding off. Paras were slightly higher in sympathy and balatas were very quiet. On February 14 ribs were 38 cents, buyers; 38¼ cents, sellers.

During the last week of February the market developed strength. Prices were around 39½ cents, but buyers' ideas were one cent lower for spot.

Importations of all grades in January were 45,736 tons, compared with 38,697 tons one year ago. Plantation arrivals for January were 42,646 tons compared with 36,372 tons one year ago. Arrivals of crude rubber, February 1 to 18 were 10,516 tons. Arrivals for the full month are estimated at 29,000 tons, as compared with 45,736 tons for January.

RUBBER AFLOAT TO THE UNITED STATES

(Figures in Long Tons)

Week ended	Bt. Malaya	Ceylon	E. Indies	London and Liverpool	Total
January 29	6,819	1,080	1,349	197	9,445
February 5	3,187	1,001	1,147	150	5,485
February 12	4,414	327	1,412	153	6,306
February 19	4,284	835	1,209	720	7,048

Low and High New York Spot Prices

Plantations	February 1927*	February 1926	February 1925
First latex crepe	$0.37½ @ $0.39½	$0.57 @ $0.70	$0.34¾ @ $0.38
Smoked sheet, ribbed	.37¼ @ .39	.55½ @ .69	.34⅜ @ .37
Paras			
Upriver, fine	.27¾ @ .30	.48 @ .63	.31½ @ .33¼
Upriver, coarse	.20½ @ .26	.30 @ .50	.25¼ @ .26¾
Islands, fine	.25 @ .27	.43 @ .57	.28¼ @ .29½
Cametá		.33 @ .39	.16½ @ .17½

*Figured to February 24, 1927.

New York Open Market—Spot Closing Rubber Prices—Cents Per Pound

Plantations Sheet	January, 1927 24	25	26	27	28	29	31	February, 1927 1	2	3	4	5	7	8	9	10	11	*12	14	15	16	17	18	19
Ribbed smoked	38¼	38	37⅞	38½	38⅞	38	38	37⅞	37¾	37⅜	37½	37⅝	37¾	37⅝	38	37¾	38	....	38⅛	38⅛	38⅛	38⅜	38½	38⅞
Crepe																								
First latex	38⅝	38⅜	38¼	38¾	38⅜	38⅜	38⅛	38¼	38⅛	37¾	38	38⅛	38⅛	38	38¼	38⅛	38½	....	38½	38½	38½	38¾	39	39¼
No. 2 blanket	36¼	35⅞	35⅜	35⅝	35½	35½	35½	35⅛	34¾	34½	34⅞	35	35¼	35	35¼	35¼	35⅜	....	35¾	35½	35¼	35¾	35⅞	36⅛
No. 3 blanket	35⅜	35¼	34⅞	35¼	35	35⅛	35	34⅞	34⅜	34⅛	34⅜	34⅝	34⅝	34½	34⅝	34⅝	34⅜	....	34⅞	34⅞	34⅞	34⅞	35¼	35¼
No. 4 blanket	34½	34⅜	34¼	34⅜	34½	33	33	33	33½	33½	33⅜	33⅝	33½	33⅜	33⅝	33⅝	33⅝	....	33¾	33¾	33¾	33⅞	34¼	34⅜
Thin clean brown	35½	35⅜	35⅛	35¼	35¼	35⅛	35⅛	34⅞	34½	34⅛	34½	34⅝	34⅝	34½	34⅝	34⅝	34⅞	....	34⅞	35	35	35	35⅜	35⅜
Rolled brown	31⅞	31½	31½	31⅜	31¼	30¾	30⅝	30⅞	30⅝	30½	30⅜	30⅝	30⅝	30½	30⅝	30⅝	30¾	....	31½	31¾	31⅜	31⅛	31⅝	31⅝
Off latex	38⅛	37⅞	37¾	38¾	38		37⅞	37¾	37½	37½	37¼	37⅜	37½	37⅝	37⅝	37⅝	37⅞	....	38⅛	38	37⅞	38¼	38½	38¼

* Holiday.

New York Quotations

Following are the New York spot and future rubber quotations for one year ago, one month ago and February 24, the current date:

Plantation Hevea	February 23, 1926	January 25, 1927	February 24, 1927
Rubber latex (Hevea)....gal.	$2.50 @	$1.50 @	$1.50 @
CREPE			
First latex crepe, spot.....	.57 @.58	.38¾@.39	.39½@.39¾
Feb.-Mar.	.57 @.58	.39 @.39¼	.39¾@
Apr.-June	.55 @.56	.39¾@.40	.40¼@
July-Sept.	.54 @.55	.41 @	.41 @.
Oct.-Dec.	@	@	.42 @
Off latex, spot.....	.56 @.57	.38¼@.38½	.39 @
Amber No. 2, spot.....	.54 @.55	.36¼@.36½	.36½@
Feb.-Mar.	.53 @.54	.36¼@.36½	.36½@
Apr.-June	.52 @.53	.37 @	.37 @
July-Sept.	.51 @.52	.37½@	†.37 @
Amber No. 3, spot.....	.52½@.53½	.35¾@.36	.36 @
Brown, thin, clean.....	.51 @.52	.35 @.35½	.36 @
Brown specky.....	.50 @	.35 @.35¼	.35½@
Brown, roll.....	.48 @	.31½@.32	.32 @
Sole crepe.....	1.00 @	.60 @	.62 @
Sheet			
Ribbed, smoked, spot.....	.55½@.56	.38½@.38¼	.39 @
Feb.-Mar.	.55½@	.38¾@.39	.39¼@
Apr.-June	.54½@.55½	.39½@.40	.40 @
July-Sept.	.53 @.54	.40¼@.40½	.41 @
Oct.-Dec.	@	@	.42 @
East Indian			
PONTIANAK			
Banjermassin	.17½@	.12 @	.10½@
Pressed block.....	.29 @	.23½@	.20 @
Sarawak	@	@	@
South American			
PARAS			
Upriver, fine.....	.48 @	.29 @	.30 @
Upriver, fine.....	*.69 @	@	*.41 @
Upriver, medium.....	@	.26 @	.25 @
Upriver, coarse.....	.37 @	.22 @	.23 @
Upriver, coarse.....	*.54 @	*.33½@	*.34½@
Islands, fine.....	@	.25½@	.27 @
Islands, fine.....	*.65 @	@	*.39 @
Acre, Bolivian, fine.....	.49 @	.30 @	.31 @
Acre, Bolivian, fine.....	*.70 @	*.41 @	*.42 @
Beni, Bolivian.....	.49 @	.30 @	.31 @
Madeira, fine.....	.49 @	.30 @	.31 @
Peruvian, fine.....	@	.28 @	.29 @
Tapajos, fine.....	.47 @	.27 @	.27 @
CAUCHO			
Upper Caucho ball.....	.38 @	.23 @	.25 @
Upper Caucho ball.....	*.55 @	*.34 @	*.35½@
Lower Caucho ball.....	.36 @	.21 @	.23 @
Manicobas			
Ceará negro heads.....	.40 @	.24 @	.24 @
Ceará scrap	.12 @	.14 @	.14 @
Manicoba, 30% guarantee.	.42 @	.28 @	.28 @
Mangabiera, thin sheet....	.42 @	.28 @	.28 @
Centrals			
Central scrap.....	.42 @	.23 @	.23 @
Central wet sheet.....	.32 @	.17 @	.16 @
Corinto scrap.....	.42 @	.23 @	.22¾@
Esmeralda sausage.....	.42 @	.23 @	.23 @
Guayule			
Duro, washed and dried....	.50 @	.31 @	.31 @
Gutta Percha			
Gutta Siak.....	.33 @	.26½@	.25 @
Gutta Soh.....	@	@	.46 @
Red Macassar.....	3.50 @	3.00 @	3.00 @
Balata			
Block, Ciudad Bolivar....	.65 @	.39½@	.39 @
Colombia	.53 @	.38 @	.38 @
Panama	.53 @	@	@
Surinam, sheet.....	.75 @	.68 @	.66 @
amber	.83 @	.72 @	.73 @
Chicle			
Honduras	‡.64 @	‡.56 @.60	‡.56 @.
Yucatan, fine.....	‡.65 @	‡.56 @.60	‡.56 @

*Washed and dried crepe. Shipment from Brazil.
†Nominal. ‡Duty paid.

DURING 1926 ARGENTINA REPRESENTED THE LEADING MARKET FOR American-made automobile tires, thus outstripping the United Kingdom which for some years has held first rank. The figures, according to the Department of Commerce, are as follows: United Kingdom, 1925, 185,022 casings imported, value $2,195,481; (1926) 151,980, value $2,515,790. Totals for Argentina are: (1925) 178,434 casings, value $2,021,527; (1926) 200,698, value $2,817,639.

London

During the week ended January 29 the the London market for the first two days was quiet, showing reductions of ⅛ to ¼ pence, on advices from the Far East. This was followed by a little buying support resulting in recovery of the reductions. Friday the market was quiet with the final prices ⅛ to ¼ pence higher. This advance was lost the next day when the price was 19¼ pence.

The market for the week ended February 5, opened steady, but was irregular, steady and sagging by turns. Business was moderate and on Wednesday all positions closed with ⅛ pence advance. The week closed with little doing at 18⅞ pence.

The following week began with prices weak and off ⅛ pence in all positions. Business was moderate as the week advanced and the price rose ⅛ pence on Wednesday. Trade continued restricted. The market on Friday failed to reflect the increase in London stocks and advanced ¼ pence on all positions. On February 12 the price closed at 19 pence.

The week ended February 19 began dull and featureless with the price steady at 18⅞ pence. This was followed by ⅛ pence decline in all positions. The last of the week, the price advanced to 19⅜ pence on the 18th. The price was firm and there was much heavy buying of nearby futures.

London stocks increased 3,300 tons from January 22 to February 19. The weekly record is as follows: January 22, 53,662 tons; January 29, 54,786 tons; February 5, 55,740 tons; February 12, 56,939 tons; February 19, 56,962 tons.

Singapore

During the last week of January spot ribs declined because of native selling. There was good c.i.f. business with the West at 18⅝ pence for spot. During the first three weeks of February the market was generally dull and steady, with a slight advance on Western cables. On February 21 sellers quotation on spot was 18¾ pence.

INDIA'S PLANTING INDUSTRY

In 1925 there were 1,070 rubber plantations in South India and Burma, covering an area of 201,222 acres. This compares with 998 estates with a total area of 193,911 acres in 1924. While 5,116 acres of new plantings were added during the year, 1,968 acres were abandoned, leaving net increase at 3,148 acres.

The total planted area in 1925 was 132,570 acres, an increase of 2 per cent over 1924, and of this acreage 93,528 acres were productive. Of the planted area, 50 per cent was in Burma, 31 per cent in Travancore, 9 per cent in Madras, 7 per cent in Cochin, 2 per cent in Coorg and one per cent in Mysore.

The combined output was 19,970,188 pounds, including 19,747,931 pounds of Hevea rubber, 61,274 pounds of Ceara rubber and 160,893 pounds of Ficus rubber, as against 15,601,296 pounds of rubber comprising 15,379,259 pounds of Hevea, 60,391 pounds of Ceara and 161,646 pounds of Ficus, in 1924. The yield per acre in 1925 averaged 228 pounds against 193 pounds in 1924. The average number of persons employed was 41,964, and of these 35,103 were permanent workers.

Stocks on December 31, 1925, amounted to 4,308,773 pounds, against 5,007,798 pounds on December 31, 1924.

Total exports from British India in 1925 came to 22,000,000 pounds, an increase of 24 per cent over those of 1924. Of the exports, 42 per cent went to England, 23 per cent to Ceylon, 19 per cent to the Straits Settlements, and 14 per cent to America.

CANADIAN EXPORTS FOR 1926 OF RUBBER FOOTWEAR TOTALED, according to the Department of Commerce, the following: 1,644,130 pairs of rubber boots and shoes, value $2,740,594; and 4,985,933 pairs of canvas rubber-soled shoes, value $3,829,291. The leading market for these goods was the United Kingdom, taking 1,090,350 pairs of rubber boots and shoes, value $1,912,179; and 1,002,142 pairs of canvas rubber-soled shoes, value $796,384. Of the latter class of footwear Argentina purchased 1,544,824 pairs, value $1,002,844.

The Rubber Exchange of New York, Inc.

Trading on the Rubber Exchange from January 24 to February 19 inclusive resulted in the sale of 3,134 contracts, equivalent to 7,835 long tons, as compared to 3,388 contracts and 8,470 tons the previous month. American rubber consumption in February proceeded at virtually the same rate as in January. In general the market for futures was dull, sagging and featureless with absence of buying interest. The high on futures from March to October ranged from 38.6 cents to 42.4 cents.

During the last week of January the market was soft and receding, with February-March leading the decline, which amounted to 0.30 to 0.50 cents by the week-end liquidation. There was no buying interest. All positions were down at the week-end. The range of high prices for March to December positions was from 38.8 cents to 42.0 cents. In the month of February prices continued to decline. The market was irregular, with no buying interest on the part of consumers. Small declines ruled in all positions, averaging ¼ cent on all positions with highs running from ¼ to ½ cent lower than those of the week previous.

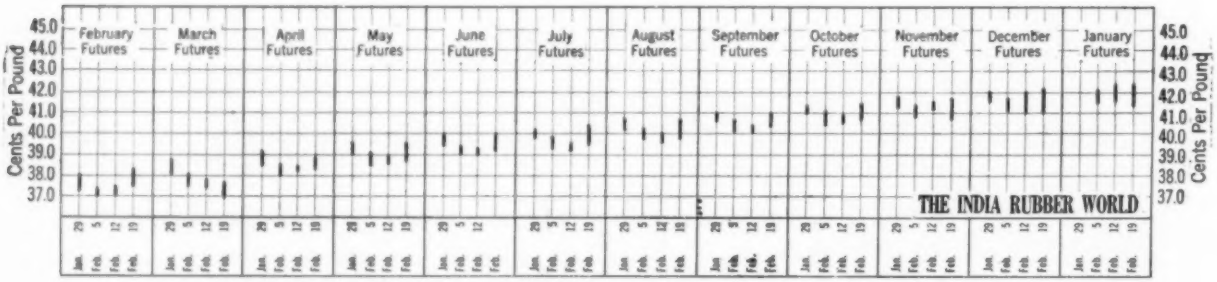
During the week from February 7 to 12 little interest was manifest and market was dull. The price movement was downward, the decline averaging less than ¼ cent on March to December futures.

In the week February 14 to 19 the market opened dull and featureless, declining in three active deliveries. This was succeeded by firmness and an outburst of strength, the week closing with aggressive buying. This advanced all positions from ½ to ¾ cents, restoring the prices closely to those that prevailed in the market of January 24. The prices closed strong at 38.6 cents for March to 42.4 cents for December.

Trading in rubber futures February 24 assumed lively proportions in an active session. Buying support was ample and there appeared to be plenty of rubber on hand, and values wound up unchanged to 20 points below the previous closing figures on the active positions.

The first year of trading just completed has fully justified the establishment of the Exchange.

New York Rubber Exchange—High and Low Monthly Futures—Cents Per Pound



The Rubber Exchange of New York, Inc.

Daily Market Futures—Ribbed Smoked Sheets—Closing Prices—Cents Per Pound

1927	January 24	25	26	27	28	29	31	February 1	2	3	4	5	7	8	9	10	11	*12	14	15	16	17	18	19	21	*22	23
Jan.	38.1	38.2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Feb.	38.1	37.6	37.6	37.8	37.8	37.3	37.2	37.4	37.2	36.8	37.0	37.2	37.2	37.0	37.5	37.5	37.4	...	37.8	37.8	37.5	37.9	38.2	38.3	38.0	...	...
Mar.	38.8	38.3	38.1	38.6	38.5	38.1	38.1	38.0	37.7	37.5	37.6	37.8	37.8	37.4	37.8	37.8	37.7	...	38.1	38.0	37.7	38.1	38.5	38.6	38.4	...	38.7
Apr.	39.2	38.8	38.6	39.0	39.0	38.5	38.6	38.3	38.3	38.0	38.1	38.2	38.3	38.2	38.5	38.4	38.4	...	38.6	38.5	38.4	38.6	38.8	38.9	38.8	...	39.2
May	39.6	39.3	39.1	39.6	39.4	39.0	39.1	39.0	38.8	38.5	38.6	38.8	38.8	38.6	38.9	38.8	38.7	...	39.2	39.0	38.7	39.2	39.6	39.6	39.5	...	39.8
June	39.7	39.6	39.4	40.0	39.9	39.5	39.4	39.4	39.2	39.0	39.0	39.2	39.2	39.0	39.3	39.2	39.1	...	39.5	39.5	39.2	39.5	39.9	40.0	39.8	...	40.2
July	40.2	40.0	39.7	40.3	40.2	39.9	39.8	39.8	39.6	39.3	39.3	39.4	39.4	39.2	39.6	39.4	39.3	...	39.7	39.7	39.5	39.8	40.2	40.4	40.2	...	40.6
Aug.	40.5	40.3	40.2	40.7	40.5	40.3	40.3	40.3	40.0	39.7	39.7	39.8	39.8	39.6	40.0	39.8	39.7	...	40.1	40.0	39.8	40.1	40.4	40.8	40.6	...	41.0
Sept.	41.0	40.7	40.6	41.0	40.8	40.7	40.7	40.7	40.4	40.1	40.1	40.2	40.3	40.0	40.4	40.2	40.1	...	40.5	40.4	40.1	40.4	40.6	41.0	40.9	...	41.0
Oct.	41.4	41.1	41.0	41.3	41.2	41.0	41.1	41.1	40.8	40.5	40.5	40.4	40.9	40.5	40.8	40.6	40.5	...	40.8	40.7	40.4	40.7	41.0	41.5	41.3	...	41.6
Nov.	41.7	41.4	41.4	41.8	41.6	41.3	41.4	41.4	41.1	40.9	40.8	41.0	41.5	40.9	41.2	40.9	40.9	...	41.1	41.0	40.7	41.0	41.3	41.8	41.8	...	42.0
Dec.	42.0	41.6	41.8	42.0	42.0	41.6	41.7	41.7	41.4	41.1	41.2	41.4	42.0	41.0	41.6	41.0	41.3	...	41.4	41.3	41.0	41.4	41.7	42.1	42.1	...	42.4
Jan.	...	...	...	...	...	...	...	42.1	41.8	41.5	41.5	41.8	42.4	41.7	42.0	41.6	41.7	...	41.5	41.6	41.3	41.8	42.1	42.4	42.4	...	42.8

*Holiday.

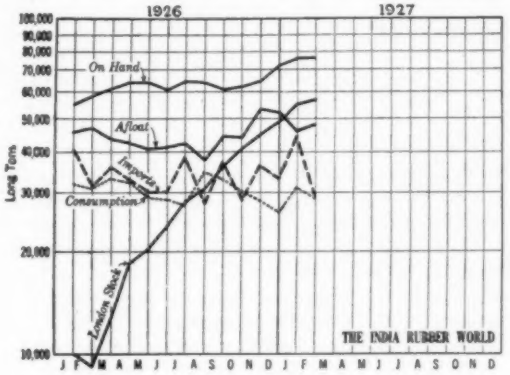
The following crude rubber importers, dealers, and brokers are listed in our Buyers' Directory. For complete information see Index of Advertisers on Page 102.

Araujo, J. G. & Co., Manaos, Brazil.
Astlett, H. A., & Co., New York, N. Y.
Baird Rubber & Trading Co., New York, N. Y.
Buckleton & Co., Ltd., Liverpool, England.
Chalfin, Joseph, & Co., Inc., New York, N. Y.
Chipman, R. L., New York, N. Y.
Dunbar, F. W., & Co., Inc., New York, N. Y.
Dunbar, J. Frank, Co., Inc., New York, N. Y.
Hankin, George, & Co., London, England.
Hardy, R. S., Co., New York, N. Y.
Henderson Brothers & Co., Inc., New York, N. Y.
Hentz, H. & Co., New York, N. Y.
Hirsch, Adolph, & Co., New York, N. Y.
Jacoby, Ernest, Boston, Massachusetts.
Littlejohn & Co., Inc., New York, N. Y.
Muehlstein, H. & Co., New York, N. Y.
Nordmann, Rossmann & Co., Hamburg, Germany.
Wilson, Charles T., Co., Inc., New York, N. Y.

Imports, Consumption, Stocks

The graph below covers completely the rubber supply, consumption and stocks for 1926. The figures for February, 1927, are estimated except London stocks which are actual.

Stocks of crude rubber in the United States at the end of January were about 76,000 tons or 4,000 tons under the amount estimated January 1. For February these stocks will remain unchanged because it is estimated that imports and consumption will be alike, namely 29,000 tons. The decline in both items is due chiefly to the shortness of the month. January consumption was 3,500 tons above the estimate for that month.



U. S. Imports, Consumption, Stocks, 1926-27

London stocks advanced in January more than the estimate and on February 19 were 56,962 tons and increasing.

UNITED STATES CRUDE RUBBER IMPORTS, CONSUMPTION AND STOCKS

	Imports Tons	Consumption Tons	Stocks On Hand† Tons	Stocks Afloat† Tons	London Tons	Singapore and Penang Tons†
1925 Twelve months	388,000	385,000	51,000*	48,000*	.....	.....
1926 Twelve months	440,195	393,245	72,510*	52,019*	48,948*	26,443*
1927 January	45,736	31,500	76,171	45,218	54,786	26,443
Feb. (estimated)	29,000	29,000	76,000	48,000	56,962‡‡	25,440

*December 31, 1927.
†The first of each month.
‡‡February 19, 1927.

AFRICAN HEVEA PLANTATIONS

From available data it is roughly estimated that there are over 38,000 acres of planted Hevea in Africa today, distributed as follows:

	Acres
Uganda	16,000
Belgian Congo	5,000
Nigeria	8,000
Gold Coast	800
Cameroons (British)	7,000
Liberia	1,400
Total	38,200

This rubber may be considered mature because with the exception of small areas in Uganda practically no planting has been done since 1914.

WASTE MATERIAL DEALERS HOLD ANNUAL MEETING

The annual meeting of the National Association of Waste Material Dealers, Inc., will be held at the Hotel Astor, New York, N. Y., on March 16, 1927, at 10:30 A. M. The fourteenth annual banquet will also be held at the Hotel Astor during the evening of the same day.

THE CONSUMPTION OF CRUDE RUBBER IN THE UNITED STATES in recent years, according to statistics prepared by the Rubber Association, has been as follows: 1921, 170,504 long tons; 1922, 282,560; 1923, 305,694; 1924, 328,769; 1925, 388,481; and 1926, 366,060 tons.

Reclaimed Rubber

New York

Reclaimers are operating their plants at nearly full rate of output. The demand is active but prices closely competitive. The new tire schedules now in effect have stimulated the demand for reclaims of high grade. In this connection it should be observed that within the past few years the progress in reclaimed rubber development has resulted in the production of very smooth, clean, high tensile reclaims which are successfully meeting the present strongly pronounced demand for such stocks used in making light gravity inner tubes.

High tensile reclaims are also becoming well established with mechanical rubber goods manufacturers where under suitable compounding conditions they have demonstrated their superior technical quality and economy.

Quotations on the full list of standard grades given below remain unchanged from those reported one month ago.

New York Quotations

February 24, 1927

	Specific Gravity	Price Per Pound
Auto Tire		
Black	1.21	$0.09¼ @ $0.09½
Black, washed	1.18	.10¾ @ .11
Black selected tires	1.20	.10½ @ .11
Dark gray	1.35	.13½ @ .14
Light gray	1.38	.14 @ .14½
White	1.40	.17 @ .17½
High Tensile Black		
Super-reclaim, No. 1	1.20	.16 @ .17
No. 2	1.20	.16 @ .17
Shoe		
Unwashed	1.60	.08¾ @ .08¾
Washed	1.50	.11 @ .11½
Tube		
No. 1	1.00	.18½ @ .20
No. 2	1.18	.15½ @ .16½
Miscellaneous		
High grade, red	1.35	.16 @ .17
Truck tire, heavy gravity	1.55	.09 @ .09½
Truck tire, light gravity	1.40	.10 @ .10½
Mechanical blends	1.60	.08¾ @ .09

The following reclaimed rubber dealers are listed in our Buyers' Directory. For complete information see Index of Advertisers on Page 102.

Bloomingdale Rubber Co., New York, N. Y.
Central Rubber Reclaiming Co., Findlay, Ohio.
Clapp, E. H., Rubber Co., Boston, Massachusetts.
Defiance Rubber Co., Defiance, Ohio.
Manhattan Rubber Manufacturing Co., Passaic, New Jersey.
Nearpara Rubber Co., Trenton, New Jersey.
New Jersey Rubber Co., Lambertville, New Jersey.
Pequanoc Rubber Co., Butler, New Jersey.
Philadelphia Rubber Works, Philadelphia, Pennsylvania.
Rubber Regenerating Co., Naugatuck, Connecticut.
Somerset Rubber Reclaiming Works, New Brunswick, New Jersey.
Stedman Rubber Products Co., South Braintree, Massachusetts.
U. S. Rubber Reclaiming Co., Inc., New York, N. Y.
Vulcan Recovery Co., Trenton, New Jersey.
Xylos Rubber Co., Akron, Ohio.

The Market for Rubber Scrap

New York

Available stocks in dealers' hands are not excessive owing to continued severe winter conditions. Business is dull in the absence of general demand from reclaimers who are well stocked. Dealers expect a brisk demand for scrap as spring opens. Quotations on most grades are unchanged. Battery jar scrap has advanced because cold pressed asphaltic boxes are rapidly displacing hard rubber boxes and are expected to do so completely.

Air Brake Hose. The price remains unchanged since last month. The supply is small but demand is less. Regular soft hose has dropped $2.00 per ton.

Boots and Shoes. These are in plentiful supply and demand is seasonal and routine.

Inner Tubes. Collections are less plentiful owing to weather conditions.

Tires. Pneumatic tires are not very plentiful. Collections are restricted by bad weather and seasonal reduction of motoring interest in touring. Truck tires are in good supply. Consumption in inner tubes and tires is very good.

Quotations for Carload Lots

February 24, 1927

Boots and Shoes			
Boots and shoes, black	lb.	$0.02	@$0.02¼
Red and white	lb.	.01	@ .01⅛
Trimmed arctics, black	lb.	.01	@ .01⅛
Untrimmed arctics	lb.	.00¼	@ .01
Tennis shoes and soles	lb.	.00¾	@ .00⅞
Hard Rubber			
No. 1 hard rubber	lb.	.10	@ .11
Battery jars, black compound	lb.	.02	@ .02½
Inner Tubes			
No. 1, floating	lb.	.09	@ .09¼
No. 2, compounded	lb.	.07	@ .07⅛
Red	lb.	.06½	@ .06¾
Mixed tubes	lb.	.07	@ .07¼
Mechanicals			
Mixed black scrap	lb.	.00¾	@ .00⅞
Heels	lb.	.00⅜	@ .00¾
Hose, air-brake	ton	33.00	@34.00
regular soft	ton	18.00	@19.00
No. 1 red	lb.	.02	@ .02⅛
No. 2 red	lb.	.01¼	@ .01⅜
White, druggists' sundries	lb.	.03	@ .03⅛
Mechanical	lb.	.01¾	@ .01⅞
Tires			
Pneumatic Standard—			
Mixed auto tires with beads	ton	25.00	@26.00
Beadless	ton	34.00	@35.00
White auto tires with beads	ton	42.00	@43.00
Beadless	ton	53.00	@54.00
Mixed auto peelings	ton	35.00	@35.50
Solid—			
Mixed motor truck, clean	ton	34.00	@36.00

Belgium's imports of American-made rubber belting have increased rapidly in recent years, as the following totals indicate: 1924, 31,633 pounds; 1925, 98,933; and 1926, 168,343 pounds.

The following scrap rubber dealers are listed in our Buyers' Directory. For complete information see Index of Advertisers on Page 102.

Birkenstein, S., & Sons, Chicago, Illinois.
Chalfin, Joseph, & Co., Inc., New York, N. Y.
Cummings, Wm. H., & Sons, New York, N. Y.
Muehlstein, H., & Co., Inc., New York, N. Y.
Norton, M., & Co., Medford, Massachusetts.
Schnurmann, J., London, England.
Weber, Hermann, Hoboken, New Jersey.

Metal Market Review

New York

Most of the metal markets have shown fair activity, the prices for tin being particularly high, with sales of good proportions. In the steel trade there have been about five weeks of slow, steady gain, the January ingot output, according to the *Iron Age*, being 3,807,000 tons, or ten per cent more than that of December, this figure, however, being considerably less than that of a year ago.

Aluminum. Virgin metal, 98 to 99 per cent pure, is now quoted at 26 cents a pound, delivered, this representing a reduction of one cent a pound on all grades of ingots. World aluminum output will be considerably greater this year than it ever has been, as new plants in Canada and on the European Continent are expected to come into full production during the year.

Antimony. The political situation in China is having its effect upon this market, and antimony shipments from that country are still reported as being light. Prices are also lower with continued lack of demand, spot antimony being quoted during the last of February at 14 cents a pound.

Copper. There has been heavy buying of copper recently, and some advance in price, following the decline during the first week of February to 12½ cents a pound, the lowest figure since July, 1924. Demands for this metal by the electrical industry are at present increasing, particularly for power developments in the Southwest. Among foreign consumers Germany is again in the lead, although France had for a time held first place.

Lead. Demand for this metal has been good and sales have been unusually heavy. The American Smelting & Refining Co., is still quoting 7.40 cents a pound, New York. Compilations prepared by the American Bureau of Metal Statistics show that in 1926 the lead production by countries representing about 85 per cent of the world's total aggregated 1,463,135 tons, compared with 1,272,056 tons in 1925.

Steel. Some authorities note the increasing specifications on contracts and intimate that expanding operations will soon be in order, although the industry as a whole will show great steadiness. The average operating rate for the steel trade during 1926, according to statistics prepared by the American Iron and Steel Institute, was 84.40 per cent while in 1925 it was 79.05 per cent.

Tin. Prices for this metal remain firm, sales of Straits tin during the last week in February being as follows: Spot and February, 69¾ cents to 69⅞ cents, March 69 to 69¼ cents, and April 68 to 68¼ cents.

Zinc. Prices of zinc ore have advanced $1 a ton to $44 in the Tri-state district, and producers are feeling more confident, particularly since the output has been reduced.

Basic Metals

February 24, 1927

	Cents per pound	
Aluminum, virgin, 98@99 per cent	26.00	@
Antimony	14.00	@
Copper—Lake, spot	13.125	@13.25
Electrolytic, spot	13.00	@13.125
Castings, refinery	12.625	@
Lead, spot, New York	7.40	@ 7.45
Lead, spot, East St. Louis	7.30	@ 7.325
Nickel, ingot, pound	35.00	@
Tin, spot	69.875	@
Zinc, spot, New York	7.15	@ 7.175
Zinc, spot, East St. Louis	6.80	@ 6.825

Steel Wire

	Base per 100 lbs.	
Bright, plain wire No. 9 gage	$2.40	@
Annealed fence wire	2.55	@
Galvanized wire No. 9	3.00	@
Spring wire	3.40	@

Copper Wire

Base Price F. O. B. Factory

	Cents per pound	
Bare copper wire	15.125	@
No. 6. B. & S. gage	15.125	@
No. 8 B. & S. gage	15.125	@
No. 14 B. & S.	16.125	@

Compounding Ingredients Market

New York

INCREASE in tire manufacturing schedules and post inventory resumption of manufacturing in the other branches of the rubber industry have stimulated demand for the general list of compounding ingredients. In certain of these, notably the materials used as fillers, keen competition still rules. The demand for them is running into heavy tonnage at very close prices.

ACCELERATORS. All types of accelerators are in good demand. The popular D. P. G. has recently been reduced in price. In each of the three types of accelerators now available, high powered, active and moderate, there is offered to the compounder ample variety to meet his practical needs.

ANTI-OXIDANTS. These important additions to the compounders' list are becoming firmly established in compounding practice because of their demonstrated efficacy in extending the life of rubber goods of all grades.

BENZOL. Production was slightly off a month ago but supplies are now ample for the improved demand.

CARBON BLACK. No special developments transpired the past month. Prices are firm. Consuming demand from the rubber industry continued at seasonal routine rate.

CLAY. The technical value of compounding clays is highly esteemed, particularly in the manufacture of wear resisting goods especially those of medium or low quality. Prices continue competitive.

LITHARGE. Rubber trade demand is routine and moderate. Prices unchanged.

LITHOPONE. Domestic is slightly lower than a month ago. Consumption is well in excess of that one year ago. Production is reported well sold up for the first half year.

MINERAL RUBBER. Trade in mineral rubber is heavy. There are but few branches of the rubber industry where it is not classed among the indispensable ingredients.

SOLVENT NAPHTHA. Demand is brisk and spot stocks rather limited. Prices are unchanged.

ZINC OXIDE. There exists a well sustained demand for material for prompt shipment. Prices are unchanged.

New York Quotations

February 24, 1927

Accelerators, Inorganic

Lead, carbonate	lb.	$0.09¾	@
Lead, red	lb.	.10¼	@
sublimed white	lb.	.09	@
sublimed blue	lb.	.09	@
super-sublimed white lead	lb.	.09½	@
Lime, R. M. hydrated	ton	15.00	@25.00
Litharge	lb.	.10¼	@
Magnesia cal., light (bbls.)	lb.	.15	@
calcined, extra light (bbls.)	lb.		@
calcined, heavy (bbls.)	lb.	.04	@ .04¼
magnesium, carb., light		.08¾	@
Orange mineral A.A.A.	lb.	.13	@
Rubber lead No. 4	lb.		@

Accelerators, Organic

Aldehyde ammonia	lb.	.80	@ .85
B. B.	lb.	1.05	@ 1.07
Captax	lb.	1.20	@ 1.50
Crylene, hard form	lb.	.70	@
Paste	lb.	.50	@
Di-ortho-tolylguanidine	lb.	.90	@
Diphenyl guanidine	lb.	.72	@
Ethylidine aniline	lb.		@
Excellerex	lb.		@
Formaldehyde aniline	lb.		@
Grasselerator 102	lb.	.80	@ .85
552	lb.	4.80	@ 5.00
808	lb.	1.15	@ 1.35
Heptene	lb.	.55	@
Hexamethylene tetramine	lb.	.80	@ .85
Hydrofuramide	lb.		@
Lithex	lb.	.18	@
Methylene aniline	lb.		@
Methylene dianiline	lb.	.40	@
Monex	lb.	3.25	@
No. 999 lead oleate	lb.	.16½	@
Piperidine penta-dithio-carb.	lb.	4.80	@ 5.50
R. & H. 50 (100 lb. drums)		.60	@ .68
Super-sulphur, No. 1	lb.	.50	@
No. 2	lb.	.18	@ .25
Tensilac No. 39	lb.	.55	@ .60
No. 41	lb.	.65	@ .68
Thionex	lb.	3.25	@
Thiocarbanilid	lb.	.22	@ .30
Trimene	lb.	.75	@
base	lb.	1.20	@
Triphenylguanidine	lb.	.69	@
Tuads	lb.	3.25	@
Vulcanex	lb.	.86	@
Vulcanol	lb.	1.08	@
Vulcone	lb.	.74	@
W-29	lb.	1.65	@
W-87	lb.		@
Zimate	lb.	4.00	@

Acids

Acetic 28% (bbls.)	100 lbs.	3.63	@
glacial (carboys)	100 lbs.	12.66	@
Oleic	lb.	.09½	@ .09¾
Stearic	lb.	.14	@ .14½
Sulphuric, 66%	100 lbs.	1.60	@

Alkalies

Caustic soda, solid	lb.	$0.03	@
Sulphite soda	100 lbs.	3.50	@

Anti-Oxidants

Age-Rite	lb.	.85	@ .90
Antox	lb.	.83	@
V. G. B.	lb.	.66	@

Colors

BLACK

Bone	lb.	.05	@ .21
Carbon (see Comp. Ing.)			
A. & W. nonfil No. 1	lb.	.40	@
No. 2	lb.	.25	@
Drop	lb.	.07	@ .20
Lampblack (commercial)	lb.	.10	@ .40

BLUE

A. & W. blue	lb.	1.25	@ 5.00
Du Pont, N.	100 lbs.	1.35	@
Marine, A. C.	100 lbs.	1.30	@
5 R	100 lbs.	1.00	@
2 G	100 lbs.	.90	@
Prussian	lb.	.33	@ .35
Ultramarine	lb.	.09	@ .25

BROWN

Sienna, Italian	lb.	.04	@ .06
Umber, Turkey	lb.	.04	@ .06

GREEN

A. & W. green	lb.	1.25	@ 3.00
Chrome, light	lb.	.27	@
medium	lb.	.29	@
dark	lb.	.31	@
Du Pont, A. C.	100 lbs.	3.00	@
4 G	100 lbs.	.60	@
G. L.	100 lbs.	.30	@
Y. L.	100 lbs.	.75	@
Oxide of chromium	lb.	.38	@

ORANGE

Du Pont, 2 R.	100 lbs.	1.40	@
R. X.	100 lbs.	1.30	@
Y. O.	100 lbs.	1.60	@

RED

A. & W. red	lb.	.75	@ 3.50
purple	lb.	2.00	@ 4.00
Antimony, golden, No. 40	lb.	.22	@ .25
No. 60	lb.	.16	@ .20
golden 15/17%	lb.	.20	@
T. K. "Special" 1%	lb.	.38	@
Pentasulphide 15/17%	lb.	.18	@
Antimony,			
Crimson, R.M.P. No. 3	lb.	.48	@
Sulphur free	lb.	.52	@
T. K. 15/17%	lb.	.40	@
Sulphur free	lb.	.50	@
7-A	lb.	.35	@
7-2	lb.	.20	@
Vermilion, No. 5	lb.	.50	@ .55
No. 15	lb.	.37½	@ .42
Du Pont R. I.	100 lbs.	2.00	@
6 B.	100 lbs.	1.10	@
4 B L.	100 lbs.	.60	@
Brilliant A. C.	100 lbs.	1.05	@

Colors—*(Continued)*

RED—*(Continued)*

Iron Oxides

bright pure domestic	lb.	$0.12	@
bright pure English	lb.	.14	@
bright reduced English	lb.	.10½	@
bright reduced domestic	lb.	.10	@
Indian (maroon), pure domestic	lb.	.11	@
Indian (maroon), pure English	lb.	.11	@ .12
Indian (maroon), reduced English	lb.	.09¾	@ .10
Indian (maroon), reduced domestic	lb.	.08	@
Oximony	lb.	.13¼	@
Spanish red oxide	lb.	.04	@
Venetian reds	lb.	.02	@ .06
Vermilion, English quick-silver	lb.	1.63	@ 1.65

WHITE

Albalith	lb.*		@
Lithopone	lb.	.05½	@
Azolith	lb.	.05¼	@ .05¾
Grasselli	lb.	.05⅜	@ .05¾
Sterling	lb.	.05⅜	@ .06⅛
Zinc Oxide			
AAA (lead free)	lb.	.07¼	@ .07⅜
Azo (factory):			
ZZZ (lead free)	lb.	.06½	@ .07
ZZ (5% leaded)	lb.	.06⅝	@ .07⅛
Z (8% leaded)	lb	.06⅝	@ .07⅛
French Process			
Green seal	lb.	.10⅜	@
Red seal	lb.	.09¾	@
White seal	lb.	.11⅜	@
Horse Head Brands			
Selected	lb.*		@
Special	lb.*		@
XX red	lb.*		@
Palmerton Process			
Kadox, black	lb.*		@
blue	lb.*		@
red	lb.*		@
Leaded Brands			
Lehigh	lb.*		@
Standard	lb.*		@
Sterling	lb.*		@
Superior	lb.*		

YELLOW

A. & W. yellow	lb.	2.00	@ 4.00
T. K. Sulphide	lb.	.65	@
Cadmium sulphide	lb.	1.50	@
Chrome	lb.	.17	@ .18
Du Pont N.	100 lbs.	4.00	@
R. R.	100 lbs.	1.55	@
Grasselli cadmium	lb.	1.50	@
Ochre, domestic	lb.	.01¾	@ .02
imported	lb.	.04½	@ .04¾
Oxide, pure	lb.	.11	@
Zinc imp.	lb.	.24	@

* Prices on application.

Colors—*(Continued)*

Compounding Ingredients

Aluminum flake (sacks c.l.)	*ton*	$21.85	@
(sacks l.c.l.)	*ton*	24.50	@
Silicate	*ton*	18.00	@24.00
Ammonium carbonate powd.	*lb.*	.11	@
lump	*lb.*	.10	@
Asbestine	*ton*	13.50	@14.50
Barium, carbonate	*ton*	55.00	@
dust	*lb.*	.05	@ .06
sulphate	*lb.*	.04	@
Barytes, imported	*ton*	27.00	@36.00
water ground and floated	*ton*	23.00	@25.00
Basofor	*lb.*	.04½	@
Blanc fixe, dry	*ton*	85.00	@90.00
pulp	*ton*	60.00	@63.00
Carbon Black			
Aerfloted arrow	*lb.*	.09	@ .13
Compressed	*lb.*	.07½	@ .11½
Uncompressed	*lb.*	.07	@ .11
Micronex	*lb.*	.08	@ .12
Carrara filler	*lb.*	.01½	@
Chalk	*ton*	18.00	@20.00
Clay, Blue Ridge, dark	*ton*	9.00	@
light	*ton*	12.00	@
China	*lb.*	.01½	@
Dixie	*ton*	15.00	@
Langford	*ton*	12.00	@
Mineral flour (Florida)	*ton*	20.00	@23.00
Perfection	*ton*	16.00	@27.00
Suprex	*ton*	13.00	@26.00
Cotton flock, black	*lb.*	.10½	@ .12½
light-colored	*lb.*	.12	@ .14
white	*lb.*	.14	@ .24
Fossil flour	*lb.*	.02½	@
Glue, high grade	*lb.*	.17	@ .24
low grade	*lb.*	.17	@ .20
Infusorial earth	*lb.*	.02½	@
Mica, amber (fact'y)	*lb.*	.05	@
Pumice stone, powd	*lb.*	.02½	@ .04
Rotten stone (bbls.)	*lb.*	.02½	@ .04½
Soap bark	*lb.*	.12½	@ .13
Soapstone	*ton*	15.00	@22.00
Sodium bicarb	*100 lbs.*	.02½	@
Stearex	*lb.*	.10	@ .14
Talc, domestic	*lb.*	.01¼	@
French	*ton*	18.00	@22.00
Thermatomic carbon	*lb.*	.05	@
Velvetex	*lb.*	.04	@ .07

New York Quotations

Compounding Ingredients—*(Continued)*

February 24, 1927

Whiting:			
Commercial	*100 lbs.*	$0.85	@$1.00
English, cliffstone	*100 lbs.*	1.50	@
Quaker	*ton*	13.00	@
Snow white	*ton*	12.00	@23.00
Sussex	*ton*	8.00	@
Westminster Brand	*100 lbs.*		@
Witco (c.l.) (fact'y)	*ton*	12.00	@20.00
Whiting, imp. chalk	*100 lbs.*	1.00	@ 1.25
Paris White, Eng. Cliff	*100 lbs.*	1.50	@ 2.50
Wood flour	*ton*	40.00	@

Mineral Rubber

Genasco (facty.)	*ton*	50.00	@52.00
Gilsonite (fact'y)	*ton*	37.14	@39.65
Granulated M. R.	*ton*	33.00	@38.00
Hydrocarbon, hard	*ton*	28.00	@34.00
Hydrocarbon, soft	*ton*	28.00	@34.00
Ohmlac Kapack, M. R.	*ton*	60.00	@
M-4	*ton*	175.00	@
Paradura (fact'y)	*ton*	62.50	@65.00
Pioneer, M. R., solid (fac.)	*ton*	42.00	@44.00
M. R. granulated	*ton*	52.00	@54.00
Robertson, M. R. solid (facty.)	*ton*	34.00	@80.00
M. R. gran. (facty.)	*ton*	34.00	@80.00

Oils (Softeners)

Castor, No. 1, U. S. P.	*lb.*	.13¾	@
No. 3, U. S. P.	*lb.*	.13¼	@
Corn, crude (bbls.)	*lb.*	.12	@
Cotton	*lb.*	.09	@ .10
Fluxrite fluid	*lb.*	.05	@ .06
solid	*lb.*	.05	@ .06
Glycerine	*lb.*	.27	@ .28
Linseed, raw	*lb.*	.11	@
Palm lagos	*lb.*	.10	@
niger	*lb.*	.09½	@
Peanut, crude	*lb.*	.13	@
refined	*lb.*	.16	@
Petrolatum, standard	*lb.*	.06	@ .08
sticky	*lb.*	.08	@ .10
Pine, steam distilled	*gal.*	.70	@ .72
Plastone	*lb*	.39	@
Rapeseed, refined	*lb.*	.11¼	@
Rosin	*gal.*	.70	@

Resins and Pitches

Pitch	*bbl.*	9.00	@10.00
Pine tar, retort	*bbl.*	16.00	@16.50
Ponto	*lb.*		@
Rosin, K (bbl.)	*280 lbs.*	14.55	@
Shellac, fine orange	*lb.*	$0.70	@
Tar, kiln	*bbl.*	15.50	@16.00

Solvents

Benzol (90%, 7.21 lbs. gal.) pure	*gal.*	.29	@
Carbon bisulphide (10.81 lbs. gal.) 99.9% pure (drums)	*lb.*	.05½	@ .06¼
tetrachloride (13.28 lbs. gal.) 99.7% pure (drums)	*lb.*	.06¼	@
Gasoline			
No. 303			
Tankcars	*gal.*	.19	@
Drums, c. l.	*gal.*	.23½	@
Drums, l. c. l.	*gal.*	.31	@
Turpentine, spirits	*gal.*	.71	@ .72
wood, steam distilled	*gal.*	.67	@ .68

Substitutes

Black	*lb.*	.08	@ .14
Brown	*lb.*	.08	@ .15
White	*lb.*	.09	@ .17

Vulcanizing Ingredients

Sulphur			
Velvet flour	*100 lbs.*	2.60	@ 3.50
Soft rubber (c.l.)	*100 lbs.*	2.60	@ 2.95
(l.c.l.)	*100 lbs.*	2.95	@ 3.30
Superfine commercial flour			
(c.l.)	*lb.*	2.20	@ 2.90
(l.c.l.)	*lb.*	2.80	@ 3.10
Tire brand, superfine	*100 lbs.*	2.20	@ 2.55
Tube brand, velvet	*100 lbs.*	2.60	@ 2.95

(See also Colors—Antimony)

Waxes

Wax, beeswax, white, com.	*lb.*	.55	@
carnauba	*lb.*	.38	@ .50
ceresine white	*lb.*	.13	@
montan	*lb.*	.07	@ .07½
ozokerite, black	*lb.*	.30	@
green	*lb.*	.32	@

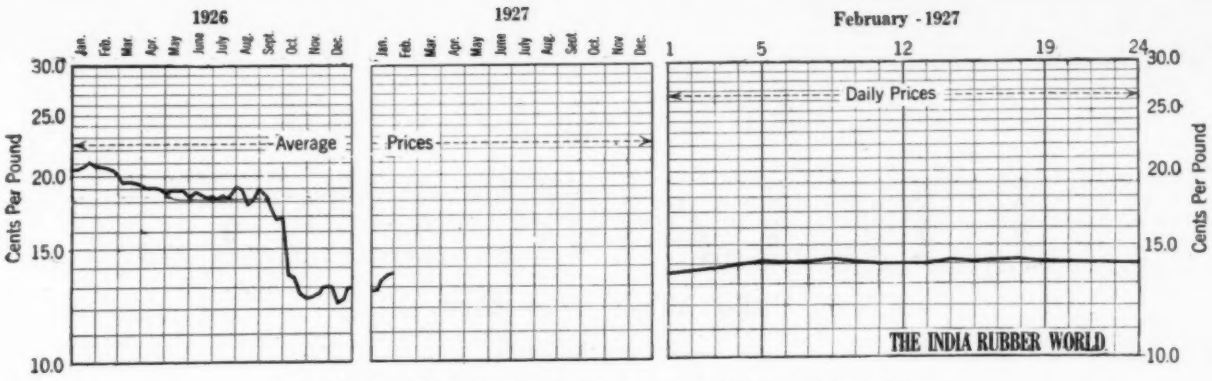
Paraffin

122/124 white crude scale	*lb.*	.04¾	@
124/126 white crude scale	*lb.*	.05	@
123/125 fully refined	*lb.*	.05¼	@ .05¼
125/127 fully refined	*lb.*	.05½	@

REPORT OF RIMS INSPECTED AND APPROVED BY THE TIRE AND RIM ASSOCIATION OF AMERICA, INC.

Rim Size	Twelve Months, 1926 Number	Per Cent	Twelve Months, 1925 Number	Per Cent
Motorcycle Rims				
24 x 3	23,324	0.1	15,439	0.1
26 x 3	86,231	0.4	95,200	0.4
28 x 3	4,990	0.0	4,105	0.0
Clincher Rims				
30 x 3	2,302	0.0	212,043	0.8
30 x 3½	2,562,763	10.6	4,997,398	19.2
31 x 4	63,061	0.3	622,885	2.4
Balloon Rims				
25 x 3½	733	0.0	2,570	0.0
26 x 3½	215,630	0.9	.....	....
27 x 3½	8,238	0.0	2,783	0.0
28 x 3½	10,126,657	41.5	8,643,872	33.3
29 x 3½	254	0.0	144,390	0.6
26 x 4	149,371	0.6	.....	....
27 x 4	13,126	0.1	.....	....
28 x 4	3,666,326	15.1	2,946,538	11.3
29 x 4	2,036,736	8.4	1,639,874	6.3
30 x 4	12,260	0.1	289,753	1.1
27 x 4½	19,479	0.1	.....	....
28 x 4½	808	0.0	.....	....
29 x 4½	353,159	1.5	551,720	2.1
30 x 4½	1,682,419	7.0	1,628,419	6.3
31 x 4½	33,363	0.1	251,259	1.0
29 x 5	189	0.0	.....	....
30 x 5	243,071	1.1	402,899	1.6
31 x 5	401,829	1.7	464,143	1.8
33 x 6	153,939	0.6	109,107	0.4
High Pressure Rims				
30 x 3½	191,342	0.8	616,683	2.4
32 x 3½	14,678	0.1	26,514	0.1
31 x 4	23,323	0.1	1,515	0.0
32 x 4	185,557	0.8	316,147	1.2
33 x 4	19,484	0.1	27,214	0.1
34 x 4	168	0.0	759	0.0
32 x 4½	429,304	1.8	637,800	2.4
33 x 4½	2,250	0.0	1,854	0.0
34 x 4½	34,317	0.1	96,924	0.4
36 x 4½	.....	....	154	0.0
Truck, 20-inch				
30 x 5	1,006,206	4.2	840,768	3.2
32 x 6	206,892	0.9	162,050	0.6
34 x 7	56,885	0.2	22,612	0.1
36 x 8	13,971	0.1	10,904	0.0
40 x 10	485	0.0	815	0.0
Truck, 24-inch				
34 x 5	49,847	0.2	109,871	0.4
36 x 6	73,798	0.3	75,309	0.3
36 x 7	1,817	0.0	77	0.0
38 x 7	17,623	0.1	8,591	0.0
40 x 8	10,252	0.0	16,174	0.1
44 x 10	1,156	0.0	718	0.0
Total	24,199,613	100.0	25,997,850	100.0

	Per Cent		Per Cent
Motorcycles	0.5	Motorcycles	0.5
Clinchers	10.9	Clinchers	22.4
Balloons	78.8	Balloons	66.8
High pressure	3.8	High pressure	5.6
Trucks—20-inch	5.4	Trucks—20-inch	4.0
Trucks—24-inch	0.6	Trucks—24-inch	0.7



Ratio Graph of New York Daily Prices of Spot Middling Upland Cotton

Market for Cotton and Fabrics

New York

AMERICAN COTTON. The market for spot middling cotton the past month was strong, showing good demand at steadily advancing prices. On February 1 the spot price was 13.65 cents and on the 19th 14.10 cents. Passage of the farm relief bill by Congress served as a bullish influence and caused some of the advance. This has approached a lull where temporary reaction is considered probable by curtailment of buying. The question of reduction of acreage for the coming crop will soon assume dominant influence in the market. Little reduction seems likely in Texas, the largest cotton producer.

One trade opinion places the total annual consumption of cotton at 1,000,000 bales, of which about 600,000 bales are used in making tires, and the balance for mechanical goods, automobile topping, miscellaneous manufactures and factory operating supply. Of the 600,000 bales one-eighth is probably Egyptian. Thus the latter is still an important factor in the tire industry.

EGYPTIAN COTTON. The demand for Egyptians has been moderate the past month. On February 23 Boston quotations for spot were uppers 21 to 21½ cents. Saks, 33 to 29⅜ cents.

Cotton Fabrics

DUCKS, DRILLS AND OSNABURGS. There is a good demand for these fabrics. Prices are firmer than a month ago. They may be expected to advance still further in keeping with producing costs.

HOLLANDS. A new holland for rubber manufacturing purposes was recently announced under the head "Rubber Trade Special." This is a very good grade of cotton cloth, closely filled and with a high luster finish. It is supplied to the trade in 31, 40 and 50-inch widths.

RAINCOAT FABRICS. The demand for raincoat fabrics is active. Prices are firm and tending to advance with other cotton textile goods.

SHEETINGS. Market prices exhibit a tendency to advance. The mills are fairly well sold up and are maintaining their prices firmly. Many sheetings are rather difficult to secure for near by delivery. General conditions indicate improvement in cotton textile lines.

TIRE FABRICS. Inquiry for standard grades was very active the past month. Shortly before February 1 a total of 3,000,000 pounds was contracted, mostly for delivery from May to September. Tire producers are more interested in uniformity of quality than in variety of goods. The tire fabric situation is considered sound and more satisfactory than usual. Competition is very keen with a tendency for prices to advance. The only element of weakness is found in the struggle among the fabric mills for business.

Various tire manufacturers have covered their fabric needs for the last quarter of this year. Contracts already placed and inquiries now actively appearing, manufacturing needs running through the next 10 months indicate marked increase in consumption of tire fabrics this year over last.

New York Quotations

February 24, 1927

Drills

38-inch 2.00-yard	yard	$0.15¼@
40-inch 3.47-yard		.09½@
52-inch 1.90-yard		.16½@
60-inch 1.52-yard		.20¾@

Ducks

38-inch 2.00-yard	yard	.16 @
40-inch 1.47-yard		.21½@
72-inch 16.66-ounce		.36½@
72-inch 17.21-ounce		.37½@
MECHANICAL		
Hose and belting	pound	.28½@
Specials		.32½@
TENNIS		
52-inch 1.35-yard	yard	.23¾@

Hollands

RUBBER TRADE SPECIAL		
R. T. 3 A.		
31-inch	yard	.20 @
40-inch	yard	.25 @
50-inch	yard	.45 @
RED SEAL		
36-inch		.14½@
40-inch		.15 @
50-inch		.22½@
GOLD SEAL		
40-inch, No. 72		.19 @
40-inch, No. 80		.20½@

Osnaburgs

40-inch 2.35-yard	yard	$0.13½@
40-inch 2.48-yard		.12⅝@
40-inch 3.00-yard		.10⅝@
37-inch 2.42-yard		.13⅛@

Raincoat Fabrics

COTTON		
Bombazine 60 x 64	yard	.11 @
Bombazine 60 x 48		.10¼@
Plaids 60 x 48		.11¼@
Plaids 48 x 48		.10½@
Surface prints 60 x 48		.12 @
Surface prints 64 x 60		.12¼@

Sheetings, 40-inch

48 x 48, 2.50-yard	yard	.11 @ .11¼
48 x 48, 2.85-yard		.10 @ .10¼
64 x 68, 3.15-yard		.10¾@ .11
56 x 60, 3.60-yard		.09¼@ .09½
48 x 44 3.75-yard		.08 @ .08¼

Sheetings, 36-inch

48 x 48, 5.00-yard	yard	.06⅛@ .06¼
44 x 40, 6.15-yard		.05⅛@ .05¼

Tire Fabrics

SQUARE WOVEN 17¼-ounce		
Egyptian, karded	pound	$0.43 @
Peeler, karded		.37 @
CORD 23/5/3		
Egyptian, combed	pound	.49 @
Egyptian, karded		.44 @
Peeler karded, 1 1/16-in.		.37½@
CORD 23/4/3		
Peeler, karded	pound	.38½@
CORD 23/3/3		
Peeler, karded	pound	.41 @
CORD 15/3/3		
Peeler, karded	pound	.39 @
CORD 13/3/3		
Peeler, karded	pound	.37½@
LENO BREAKER		
8-oz. Peeler, karded	pound	.36 @
10-oz. Peeler, karded		.36 @
CHAFER		
8.25-oz. Peeler, karded (2 ply)	pound	@
9.5-oz. Peeler, karded (4-ply)		@
12-oz. Peeler, karded		@
14-oz. Peeler, karded		.36 @

The Cotton Outlook

INDICATIONS of better conditions in the American cotton industry continue steadily to develop, while there are also reports of decided improvements in the English markets. Exports from the United States are said to be more than 1,260,000 bales greater than last season, while domestic consumption, according to statistics in the *Textile World*, shows a gain for the five months through December of nearly 2,830,000 bales, against 2,594,000 bales in 1925 and 2,350,000 bales in 1924.

Farm Bill Measure Injurious to Cotton Industry?

Those who have carefully studied the provisions of the McNary-Haugen bill seem to consider that the passage of the measure would ultimately prove injurious not only to the cotton industry but to other farming industries as well. One authority says that its effect will be "decidedly unfortunate," another says that "government valorization of cotton must fail in the end, and the experiment is almost certain to be a very costly one for the South." Various protests against the enactment of the bill have also been presented in the Senate, the National Association of Cotton Manufacturers, Boston, sending the following telegram:

Proposed McNary-Haugen bill is unsound economically and discriminating in its purpose. Its passage can result only in higher cost of clothing, yarn, tires, and many other articles to the consumer, and will further increase the difference in cost of manufacturing in this country and our competitors abroad, necessitating further tariff changes or loss of cotton textile industry employing over half a million. Our association with over 1,000 representative cotton manufacturers as members urges you to do your utmost to defeat this bill.

Department of Agriculture Makes Cotton Survey

As the result of a survey of present conditions in the cotton industry, the Department of Agriculture has issued a statement, of which the following is a part:

Only a drastic curtailment of cotton production the coming season will restore the balance between consumption and supply at remunerative prices to growers. Presuming average yields, a reduction of 30 per cent in acreage appears necessary to give the greatest gross value to the next crop.

A burdensome supply of American cotton for the next 12 to 18 months seems inevitable. With an estimated 1926 production of 18.6 million bales and a world carryover of American cotton on August 1, 1926, estimated at from 5.4 to 5.7 million, the supply this year totals 24.0 million bales, or more; as compared with approximately 19.4 in 1925-26; 16.3 in 1924-25; and 13.5 million bales in 1923-24.

The world's consumption of American cotton for the 12 months ending July 31, 1926, was about 14.0 million bales. Since that time consumption in this country has proceeded at a record rate. Assuming a continuance of consumption at the same rate in this country, and allowing for some further acceleration of mill activity abroad, a total world consumption for the present year of 15.0 to 15.5 million bales is quite possible.

The probable carryover at the end of the present season would be from 8.5 to 9.0 million bales, or at least 3.0 million bales more than the year before.

The chances, therefore, for profitable production the coming season are best if the crop is small, the grade and staple improved, and the costs held to the minimum.

"More Cotton from Fewer Acres"

In a recent article published in the *Textile World*, John A. Todd, author of "The World's Cotton Crops," states that the year 1926 has established both a good and bad record for the cotton industry. The area at that time planted to cotton totaled, according to Mr. Todd, 48,898,000 acres, this being 2,450,000 acres more than the corresponding figure of June 25, 1925, which again was 6,045,000 more than the total for the year previous. The average yield for the 1926 crop was however the highest since the year 1914. Another authority states that the yield of cotton per acre, 157.4 pounds in 1924-25, rose to 167.2 in 1925-26 and to 187.0 in 1926-27.

Undoubtedly this satisfactory yield per acre is in large measure due to the efforts during the last four years of the American Cotton Association, which has endeavored to train the Southern farmers in methods of intensive cotton culture, more liberal fertilization, crop rotation, etc. J. S. Wannamaker, president of the organization, in a recently published statement said in part:

In 1927, this association plans an expansive campaign to secure the planting of improved and longer staple cotton of full inch to 1⅛ inch varieties, to meet the increasing demands of the domestic mills for better grades and staples. The plan embraces the operation of hundreds of 5, 10 and 20 acre demonstration farms over the belt to be operated under an intensive system of cotton culture and planting of other crops needed on the farm and for marketing. A complete change in the old system of cotton production has become imperative in order to rehabilitate the industry and bring prosperity to the growers.

In regard to the quality of the output another authority states that:

Cotton running 1 to 1¼ inch in staple can be produced as cheaply and will yield as abundantly as that of ⅞ inch or shorter. The former commands a premium of one to twelve cents a pound over the latter, especially in the better grades. Not all the land in the South is strong enough to produce fiber longer than ⅞ inch, and the area in which 1⅛ to 1¼ inch can be grown is largely confined to the alluvial region of the lower Mississippi valley. The bulk of the land in the South, however, will easily produce staple 1 to 1⅛ inch and premiums on these lengths run from 1 to 6 cents per pound over ⅞ inch on middling and grades above, even at the prevailing basic level.

Cotton Organizations to Hold Joint Meeting

From May 12 to 14 inclusive a joint meeting will be held at Atlantic City of various cotton organizations, these including American Cotton Manufacturers Association and the National Association of Cotton Manufacturers, the sessions being under the auspices of the National Council of American Cotton Manufacturers. The first mentioned organization comprises mainly southern textile men, while the membership of the National Association includes the northern section of the country.

The following dealers in cotton goods for the rubber industry are listed in our Buyers' Directory. For complete information see Index to Advertisers on Page 102.

Adams, H. J., Co., The, Akron, Ohio.
Bibb Manufacturing Co., Macon, Georgia.
Brighton Mills, Passaic, New Jersey.
Callaway Mills, Inc., New York, N. Y.
Cannon Mills, Inc., New York, N. Y.
Curran & Barry, New York, N. Y.
Lane, J. H. & Co., New York, N. Y., and Chicago, Illinois.
Lawrence & Co., New York, N. Y.
Willingham Cotton Mills, Macon, Georgia.

United Kingdom Rubber Statistics

Imports

Unmanufactured	December, 1926		Year Ended December, 1926	
Crude rubber From—	Pounds	Value	Pounds	Value
Straits Settlements	11,862,500	£936,176	134,166,300	£13,697,477
Federated Malay States	5,666,100	450,870	63,174,100	6,244,639
British India	962,900	76,886	10,409,900	1,163,408
Ceylon and Dependencies	3,790,000	300,094	44,359,900	4,492,107
Other Dutch possessions in Indian Seas	1,867,800	155,470	19,658,200	1,931,950
Dutch East Indies (except other Dutch possessions in Indian Seas)	2,143,700	170,468	29,402,600	2,925,333
Other countries in East Indies and Pacific, not elsewhere specified	177,400	13,310	2,053,800	207,257
Brazil	1,017,100	80,523	9,671,300	987,975
Peru	.....	.....	102,000	8,576
South and Central America (except Brazil and Peru)	4,100	245	367,400	33,949
West Africa: French West Africa	1,000	60	1,422,800	123,823
Gold Coast	81,900	5,348	975,100	67,377
Other parts of West Africa	239,100	17,591	2,005,900	176,894
East Africa, Including Madagascar	187,700	14,295	1,654,100	155,745
Other countries	111,700	10,709	1,455,800	161,574
Totals	28,113,000	£2,232,045	320,879,200	£32,378,084
Waste and reclaimed rubber	474,600	6,152	6,554,000	106,819
Gutta percha and balata	571,900	69,095	7,977,300	1,010,732
Rubber substitutes	45,700	4,165	290,200	19,935
Totals	1,092,200	£79,412	14,821,500	£1,137,486
Manufactured				
Boots and shoes....*doz. pairs*	35,798	£90,482	465,476	£1,166,913
Tires and tubes				
Pneumatic				
Outer covers	.....	397,262	.....	3,957,251
Inner tubes	.....	53,536	.....	585,416
Solid tires	.....	23,687	.....	307,091
Other rubber manufactures	.....	115,319	.....	1,603,813
Totals	.....	£680,286	.....	£7,620,484

Exports

Unmanufactured				
Waste and reclaimed rubber	2,797,900	£19,281	23,803,100	£286,020
Rubber substitutes	31,000	797	878,800	21,140
Totals	2,828,900	£20,078	24,681,900	£307,160
Manufactured				
Boots and shoes....*doz. pairs*	15,172	£33,094	228,748	£395,062
Tires and tubes				
Pneumatic				
Outer covers	.....	260,992	.....	3,380,569
Inner tubes	.....	53,059	.....	701,765
Solid tires	.....	52,405	.....	441,685
Other rubber manufactures	.....	221,853	.....	3,026,902
Totals	.....	£661,403	.....	£7,945,983

Exports—Colonial and Foreign

Unmanufactured	December, 1926		Year Ended December, 1926	
Crude rubber To—	Pounds	Value	Pounds	Value
Russia	1,621,800	£243,141	14,625,900	£2,576,161
Sweden, Norway and Denmark	163,000	15,952	2,417,800	298,211
Germany	1,978,400	168,313	17,681,100	1,761,949
Belgium	298,000	25,801	2,991,400	311,914
France	1,932,700	165,831	20,960,400	2,467,000
Spain	72,800	6,101	801,300	102,083
Italy	490,100	39,537	5,519,900	767,767
Other European countries	214,800	19,566	2,438,600	259,030
United States	10,650,800	914,776	62,168,600	7,527,695
Canada	6,900	550	310,100	47,219
Other countries	47,700	4,284	865,400	108,290
Total	17,477,000	£1,603,852	130,780,500	£16,227,319
Waste and reclaimed rubber	7,500	171	220,500	6,046
Cutta percha and balata	36,200	4,194	501,700	67,063
Rubber substitutes	1,400	39	3,600	99
Totals	45,100	£4,404	725,800	£73,208
Manufactured				
Boots and shoes....*doz. pairs*	436	£1,792	8,348	£25,214
Tires and tubes				
Pneumatic				
Outer covers	.....	78,998	.....	595,627
Inner tubes	.....	6,272	.....	62,658
Solid tires	.....	1,064	.....	14,368
Other rubber manufactures	.....	11,207	.....	88,323
Totals	.....	**£99,333**	.....	**£786,190**

Dominion of Canada Rubber Statistics

Imports of Crude and Manufactured Rubber

Unmanufactured	November, 1926		Eight Months Ended November, 1926	
	Pounds	Value	Pounds	Value
Rubber, gutta percha, etc.				
From United Kingdom	1,488	$778	60,845	$22,381
United States	3,167,265	1,369,662	24,995,757	11,943,876
Straits Settlements	243,239	83,159	2,150,179	926,477
Dutch East Indies	54,987	22,913	244,260	122,160
Other countries	.....	.....	11,200	15,600
Totals	3,466,979	$1,476,512	27,462,241	$13,030,494
Rubber, recovered	750,154	$79,507	5,049,508	$601,371
Rubber, powdered and rubber or gutta percha scrap	439,715	30,294	4,813,808	268,808
Balata	.....	.....	6,000	3,968
Rubber substitutes	31,122	2,432	528,112	62,055
Totals	1,220,991	$112,233	10,397,428	$936,202
Partly Manufactured				
Hard rubber sheets and rods	4,599	$3,486	78,317	$44,996
Hard rubber tubes	.....	2,185	.....	6,917
Rubber thread not covered	13,338	18,687	89,885	142,731
Totals	17,737	$24,358	168,202	$194,644
Manufactured				
Belting	.....	$13,479	.....	$157,122
Hose	.....	15,097	.....	118,597
Packing	.....	4,355	.....	32,188
Boots and shoes.....*pairs*	20,056	32,977	47,268	78,254
Clothing, including waterproofed	.....	20,760	.....	159,445
Gloves	.....	1,633	.....	14,228
Hot water bottles	.....	1,774	.....	13,122
Tires, solid .....*number*	36	1,527	485	27,364
Tires, pneumatic.....*number*	529	13,708	31,976	223,119
Tires, tubes .....*number*	794	2,678	11,880	30,419
Elastic, round or flat	.....	16,090	.....	125,947
Mats and matting	.....	3,471	.....	33,338
Cement	.....	10,309	.....	68,749
Golf balls .....*dozen*	261	1,107	34,324	139,933
Heels, rubber .....*pairs*	12,193	381	162,861	9,793
Other rubber manufactures	.....	101,484	.....	881,874
Totals	.....	$240,830	.....	$2,113,492
Totals, rubber imports	.....	$1,853,933	.....	$16,274,832

Exports of Domestic and Foreign Rubber Goods

Unmanufactured	November, 1926		Eight Months Ended November, 1926	
	Produce of Canada Value	Re-exports of Foreign Goods Value	Produce of Canada Value	Re-exports of Foreign Goods Value
Crude and waste rubber	$40,384	.....	$205,171	.....
Totals	$40,384	.....	$205,171	.....
Manufactured				
Belting	$73,084	.....	$394,448	.....
Canvas shoes with rubber soles	191,772	.....	2,725,472	.....
Boots and shoes	240,383	.....	1,979,699	.....
Clothing, including waterproofed	2,663	.....	17,889	.....
Hose	29,059	.....	185,988	.....
Tires, casings	1,269,423	.....	9,223,296	.....
Inner tubes	239,689	.....	1,570,156	.....
Solid	35,621	.....	177,273	.....
Other rubber manufactures	62,865	$6,844	393,483	$90,170
Totals	$2,144,499	$6,844	$16,667,704	$90,170
Totals, rubber exports	$2,184,883	$6,844	$16,872,875	$90,170

Landings, Deliveries and Stocks in London and Liverpool as Returned by the Warehouses and Wharves During the Month of December, 1926

	Landed for December	Delivered for December	Stocks, December 31st		
London	Tons	Tons	1926 Tons	1925 Tons	1924 Tons
Plantation	10,264	5,402	48,741	5,583	29,346
Other grades	4	7	100	36	93
Liverpool					
Plantation	†666	†284	†1,897	†403	2,722
Para and Peruvian	229	196	505	216	141
Other grades	.....	....	.....	12	74
Total tons, London and Liverpool	11,163	5,889	51,243	6,250	32,376

† Official returns from the six recognized public warehouses.

Crude Rubber Arrivals at New York as Reported by Importers

Paras and Caucho

	Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Cametá Cases
JANUARY 27. By "Justin," Brazil.					
H. A. Astlett & Co.	548	...	177	219	...
Paul Bertuch & Co., Inc.	500	...	...	185	...
General Rubber Co.	980	38	648	188	3
Littlejohn & Co., Inc.	1,009	86	734	327	...
The Meyer & Brown Corporation	205	...	...	...	...
Poel & Kelly, Inc.	62	...	...	...	...
FEBRUARY 4. By "Beechpark," Brazil.					
H. A. Astlett & Co.	126	...	309	...	...
General Rubber Co.	36	2	5	...	...
Littlejohn & Co., Inc.	1,134	105	222	57	...
The Meyer & Brown Corporation.	144	...	39	...	...

Plantations

	Cases
JANUARY 13. By "Steel Navigator," Far East.	
Hood Rubber Co.	*320
JANUARY 14. By "Belfast Maru," Far East.	
General Rubber Co.	1,362
Charles T. Wilson Co., Inc.	695
JANUARY 14. By "Pres. Van Buren," Far East.	
Charles T. Wilson Co., Inc.	412
JANUARY 17. By "Andania," London.	
H. A. Astlett & Co., Inc.	25
General Rubber Co.	50
Meyer & Brown, Inc.	46
Poel & Kelly, Inc.	25
Charles T. Wilson Co., Inc.	150
JANUARY 17. By "Maasdam," Rotterdam.	
Littlejohn & Co., Inc.	10
JANUARY 17. By "Mahseer," Far East.	
General Rubber Co.	2,172
Poel & Kelly, Inc.	64
JANUARY 18. By "Minnekahda," London.	
Littlejohn & Co., Inc.	290
JANUARY 18. By "West Faralon," Far East.	
Littlejohn & Co., Inc.	†245
JANUARY 19. By "Blitar," Far East.	
H. A. Astlett & Co.	797
Baird Rubber & Trading Co., Inc.	207
General Rubber Co.	5,225
Haldane Bierrie & Co., Inc.	500
Littlejohn & Co., Inc.	1,518
Meyer & Brown, Inc.	122
The Meyer & Brown Corporation	830
H. Muehlstein & Co., Inc.	277
Poel & Kelly, Inc.	1,248
Rogers Brown & Crocker Bros., Inc.	134
Charles T. Wilson Co., Inc.	1,212
JANUARY 19. By "City or Stockholm," Far East.	
Haldane Bierrie & Co., Inc.	520
Littlejohn & Co., Inc.	514
Poel & Kelly, Inc.	29
JANUARY 19. By "Karroo," Far East.	
General Rubber Co.	1,815
Haldane Bierrie & Co., Inc.	250
Hood Rubber Co.	*220
Littlejohn & Co., Inc.	1,580
Poel & Kelly, Inc.	487
Charles T. Wilson Co., Inc.	227
JANUARY 19. By "Vechtdyk," Far East.	
H. A. Astlett & Co.	988
Baird Rubber & Trading Co., Inc.	314
General Rubber Co.	5,440
Haldane Bierrie & Co., Inc.	12
Littlejohn & Co., Inc.	5,204
Meyer & Brown, Inc.	3,083
Meyer & Brown, Inc.	*109
The Meyer & Brown Corporation	760
H. Muehlstein & Co., Inc.	601
Poel & Kelly, Inc.	1,727
Raw Products Co.	170
Charles T. Wilson Co., Inc.	658
JANUARY 21. By "Bloomersdyk," Rotterdam.	
H. A. Astlett & Co.	67
General Rubber Co.	100
Haldane Bierrie & Co., Inc.	260
Littlejohn & Co., Inc.	136
Poel & Kelly, Inc.	45
JANUARY 24. By "Alaunia," Liverpool.	
Hood Rubber Co.	*96
JANUARY 24. By "Antonia," Liverpool.	
Meyer & Brown, Inc.	5
Poel & Kelly, Inc.	101
JANUARY 24. By "Deutchland," Holland.	
Baird Rubber & Trading Co., Inc.	109
JANUARY 24. By "Kasenga," Far East.	
H. A. Astlett & Co.	112
Baird Rubber & Trading Co., Inc.	150
General Rubber Co.	995
Haldane Bierrie & Co., Inc.	500
Hood Rubber Co.	*85
Littlejohn & Co., Inc.	70
H. Muehlstein & Co., Inc.	117
Poel & Kelly, Inc.	330
Charles T. Wilson Co., Inc.	399
JANUARY 24. By "Laconia," Far East.	
Poel & Kelly, Inc.	45
JANUARY 24. By "Minnewaska," London.	
Littlejohn & Co., Inc.	216
JANUARY 25. By "Keemun," Far East.	
H. A. Astlett & Co.	1,805
Baird Rubber & Trading Co., Inc.	1,013
General Rubber Co.	4,003
Haldane Bierrie & Co., Inc.	396
Littlejohn & Co., Inc.	4,674
Meyer & Brown, Inc.	653
The Meyer & Brown Corporation	50
H. Muehlstein & Co., Inc.	284
Poel & Kelly, Inc.	1,287
Rogers Brown & Crocker Bros., Inc.	605
Charles T. Wilson Co., Inc.	986
JANUARY 25. By "Pres. Wilson," Far East.	
Poel & Kelly, Inc.	†150
JANUARY 25. By "Veendam," Rotterdam.	
Haldane Bierrie & Co., Inc.	260
Littlejohn & Co., Inc.	1,411
JANUARY 27. By "Ningchow," Far East.	
H. A. Astlett & Co.	2,229
Baird Rubber & Trading Co., Inc.	940
General Rubber Co.	5,518
Haldane Bierrie & Co., Inc.	1,460
Hood Rubber Co.	*278
Littlejohn & Co., Inc.	7,677
Meyer & Brown, Inc.	1,731
The Meyer & Brown Corporation	250
H. Muehlstein & Co., Inc.	810
Poel & Kelly, Inc.	2,598
Raw Products Co.	51
Rogers Brown & Crocker Bros., Inc.	373
Charles T. Wilson Co., Inc.	1,325
JANUARY 27. By "Pres. Hayes," Far East.	
H. A. Astlett & Co.	1,364
Baird Rubber & Trading Co., Inc.	2,896
Paul Bertuch & Co., Inc.	300
General Rubber Co.	1,156
Haldane Bierrie & Co., Inc.	150
Hood Rubber Co.	*150
Littlejohn & Co.	3,293
Meyer & Brown, Inc.	400
The Meyer & Brown Corporation	150
H. Muehlstein & Co., Inc.	390
Poel & Kelly, Inc.	932
Raw Products Co.	250
Rogers Brown & Crocker Bros., Inc.	266
Rogers Brown & Crocker Bros., Inc.	*329
Charles T. Wilson Co., Inc.	670
JANUARY 27. By "Wray Castle," Far East.	
H. A. Astlett & Co.	916
Baird Rubber & Trading Co., Inc.	600
General Rubber Co.	9,221
Haldane Bierrie & Co., Inc.	236
Hood Rubber Co.	*50
Littlejohn & Co., Inc.	6,063
Meyer & Brown, Inc.	567
The Meyer & Brown Corporation	1,150
H. Muehlstein & Co., Inc.	799
Poel & Kelly, Inc.	1,566
Rogers Brown & Crocker Bros., Inc.	766
Charles T. Wilson Co., Inc.	1,599
JANUARY 28. By "Forreshank," Far East.	
H. A. Astlett & Co.	26
General Rubber Co.	33
Haldane Bierrie & Co., Inc.	50
Littlejohn & Co., Inc.	927
Poel & Kelly, Inc.	379
JANUARY 29. By "Pres. Lincoln," Far East.	
Poel & Kelly, Inc.	†650
JANUARY 30. By "Pres. Cleveland," Far East.	
H. A. Astlett & Co.	†150
JANUARY 31. By "Esther Dollar," Far East.	
Baird Rubber & Trading Co., Inc.	50
Littlejohn & Co., Inc.	†324
FEBRUARY 2. By "Clan MacBean," London.	
H. A. Astlett & Co.	65
General Rubber Co.	11
Littlejohn & Co., Inc.	217
Meyer & Brown, Inc.	143
Charles T. Wilson Co., Inc.	112
FEBRUARY 2. By "Minnetonka," London.	
General Rubber Co.	90
Adolph Hirsch & Co., Inc.	10
Charles T. Wilson Co., Inc.	932
FEBRUARY 3. By "American Merchant," London.	
Baird Rubber & Trading Co., Inc.	101
Poel & Kelly, Inc.	160
Charles T. Wilson Co., Inc.	953
FEBRUARY 3. By "City of Cairo," Far East.	
H. A. Astlett & Co.	1,716
Baird Rubber & Trading Co., Inc.	366
Paul Bertuch & Co., Inc.	250
General Rubber Co.	3,353
Haldane Bierrie & Co., Inc.	100
Hood Rubber Co.	*128
Littlejohn & Co., Inc.	6,772
Meyer & Brown, Inc.	1,016
The Meyer & Brown Corporation	650
H. M ehlstein & Co., Inc.	112
Poel & Kelly, Inc.	1,117
Rogers Brown & Crocker Bros., Inc.	710
Charles T. Wilson Co., Inc.	574
FEBRUARY 4. By "Maidan," Far East.	
Hood Rubber Co.	*42
Littlejohn & Co., Inc.	112
Charles T. Wilson Co., Inc.	287
FEBRUARY 6. By "Bordeaux Maru," Far East.	
H. A. Astlett & Co.	929
Baird Rubber & Trading Co., Inc.	1,440
General Rubber Co.	3,217
Haldane Bierrie & Co., Inc.	300
Littlejohn & Co., Inc.	4,392
Meyer & Brown, Inc.	308
The Meyer & Brown Corporation	1,280
H. Muehlstein & Co., Inc.	280
Poel & Kelly, Inc.	1,305
Raw Products Co.	64
Rogers Brown & Crocker Bros., Inc.	1,056
Charles T. Wilson Co., Inc.	1,424
FEBRUARY 7. By "Tuscania," London.	
Littlejohn & Co., Inc.	100
Poel & Kelly, Inc.	80
FEBRUARY 9. By "Aurania," Liverpool.	
Charles T. Wilson Co., Inc.	85
FEBRUARY 11. By "Pres. Polk," Far East.	
H. A. Astlett & Co.	1,380
Baird Rubber & Trading Co., Inc.	400
Paul Bertuch & Co., Inc.	220
General Rubber Co.	1,050
Haldane Bierrie & Co., Inc.	250
Hood Rubber Co.	*108
Littlejohn & Co., Inc.	3,284
Meyer & Brown, Inc.	448
The Meyer & Brown Corporation	50
H. Muehlstein & Co., Inc.	470
Poel & Kelly, Inc.	996
Rogers Brown & Crocker Bros., Inc.	603
Charles T. Wilson Co., Inc.	324
FEBRUARY 11. By "Silverfir," Far East.	
H. A. Astlett & Co.	894
Baird Rubber & Trading Co.	1,640
General Rubber Co.	11,304
Haldane Bierrie & Co., Inc.	359
Littlejohn & Co., Inc.	3,686
Meyer & Brown, Inc.	303
The Meyer & Brown Corporation	1,100
Poel & Kelly, Inc.	403
Rogers Brown & Crocker Bros., Inc.	295
Charles T. Wilson Co., Inc.	345
FEBRUARY 12. By "Caronia," Europe.	
General Rubber Co.	81
FEBRUARY 13. By "London Mariner," Europe.	
General Rubber Co.	712
FEBRUARY 13. By "Masirah," Far East.	
Baird Rubber & Trading Co., Inc.	*330
FEBRUARY 14. By "City of Oran," Far East.	
Littlejohn & Co., Inc.	1,583
Raw Products Co.	334
FEBRUARY 14. By "Noordam," Europe.	
The Meyer & Brown Corporation	35
FEBRUARY 14. By "Waukegan," Europe.	
The Meyer & Brown Corporation	101
FEBRUARY 15. By "Atlanta City," Far East.	
Baird Rubber & Trading Co., Inc.	770

* Arrived at Boston.
† Arrived at Pacific Coast.

Africans

JANUARY 24. By "Rochambeau," Havre.	
Poel & Kelly, Inc.	10
JANUARY 31. By "Lafayette," Bordeaux.	
Littlejohn & Co., Inc.	196
FEBRUARY 14. By "New Georgia," Africa.	
Littlejohn & Co., Inc.	744

Balata

JANUARY 28. By "Justin," South America.	
H. A. Astlett & Co.	100
FEBRUARY 8. By "Haiti," Far East.	
Middleton & Co., Ltd.	Bales 32
FEBRUARY 14. By "Matura," Far East.	
Middleton & Co., Ltd.	Bales 25

Guayule

JANUARY 24. By "Railroad," Mexico.	
Continental Rubber Co. of New York	1,620
FEBRUARY 2. By "Railroad," Mexico.	
Continental Rubber Co. of New York	625
FEBRUARY 7. By "Monterey," Mexico.	
Continental Rubber Co. of New York	560
FEBRUARY 7. By "Railroad," Mexico.	
Continental Rubber Co. of New York	465
FEBRUARY 9. By "Panuco," Mexico.	
Continental Rubber Co. of New York	500
FEBRUARY 9. By "Railroad," Mexico.	
Continental Rubber Co. of New York	1,060

British Malaya

Rubber Exports

An official cablegram from Singapore to the Malay States Information Agency, 88 Cannon street, London, E. C. 4, England, states that the amount of rubber exported from British Malaya in the month of January, 1927, totaled 34,946 tons. The amount of rubber imported was 14,995 tons, of which 12,019 tons were declared as wet rubber. The following are the comparative statistics:

	1926		1927	
	Gross Exports Tons	Foreign Imports Tons	Gross Exports Tons	Foreign Imports Tons
January	30,452	10,237	34,946	14,995

Note—The above figures represent the totals compiled from declarations received up to the last day of the month for exports from and imports to all ports of British Malaya and not necessarily the actual quantity shipped or landed during that month.

Distribution

The following is a comparative return of distribution of shipments during the months of December, 1926, and January, 1927:

	December, 1926 Tons	January, 1927 Tons
United Kingdom	7,621	7,288
United States	24,406	23,069
Continent of Europe	2,873	2,327
British Possessions	710	595
Japan	1,186	1,664
Other foreign countries	15	3
Totals	36,811	34,946

Ceylon Rubber Exports from Jan. 1 to Dec. 7, 1926

	Tons
To United Kingdom	16,751.56
Continent	2,617.36
Australia	964.60
America	33,449.81
Egypt	7.11
Africa	72.47
India	7.32
China	2.46
Japan	132.19
Total	54,004.88

CEYLON ANNUAL EXPORTS, 1920-1925

	Tons
For the same period last year	42,330.41
For the year 1925	45,697.19
1924	37,351.13
1923	37,111.88
1922	47,260.00
1921	40,210.31
1920	38,971.59

Plantation Rubber Exports from Malaya

	January 1 to December 31, 1926		
	From Singapore Tons	From Penang Tons	From Malacca Tons
To United Kingdom	10,931.87	12,243.17	11,081.50
British Possessions	4,674.08	237.78	172.04
Continent of Europe	14,132.24	2,556.45	3,414.39
United States	150,447.01	30,794.94	14,655.48
Japan	12,159.89	2,488.34	2,416.37
Other countries	117.52	14.50	.....
Totals	192,462.61	48,335.18	31,739.78

Imports of Crude Rubber Into the United States by Customs Districts

	*December, 1926		Twelve Months Ended *December, 1926	
	Pounds	Value	Pounds	Value
Massachusetts	1,492,734	$598,771	29,225,491	$17,605,011
Buffalo	.....	.....	46,269	23,834
St. Lawrence	.....	.....	8,335	2,326
New York	74,259,499	29,281,646	856,969,525	467,900,507
Philadelphia	.....	.....	1,065,563	363,420
Maryland	3,465,498	1,384,564	8,586,988	4,172,710
New Orleans	.....	.....	5,427	2,051
Los Angeles	4,422,752	1,625,618	20,662,222	11,103,457
San Francisco	771,586	307,990	4,674,164	1,962,767
Oregon	100,811	38,805	620,266	312,744
Washington	.....	.....	1,068,000	688,408
Minnesota	.....	.....	123,200	71,251
Michigan	.....	.....	142,111	57,285
Ohio	.....	.....	1,503,835	705,786
Colorado	56,000	23,972	1,123,184	835,601
Totals	84,568,880	$33,261,366	925,824,580	$505,807,158

*Including Latex Dry Rubber Content.

United States Rubber Statistics

Imports of Crude and Manufactured Rubber

	November, 1926		Eleven Months Ended November, 1926	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	87,706,143	$34,890,536	841,310,450	$472,557,513
Balata	69,460	25,440	643,939	268,982
Jelutong or Pontianak	1,164,978	227,348	15,051,793	2,863,528
Gutta percha	437,582	95,491	2,950,919	620,446
Guayule	710,206	167,119	9,143,747	2,440,594
Rubber scrap	2,853,062	127,808	30,708,778	1,399,636
Totals	92,941,431	$35,533,742	899,809,626	$480,150,699
Chicle *dutiable*	1,175,456	$614,965	11,544,715	$5,764,109
MANUFACTURED—*dutiable*				
Rubber belting	56,335	$40,585	704,771	$471,187
Rubber tires	757	15,161	17,335	158,391
Other rubber manufactures of substitutes for rubber	.....	114,131	.....	1,229,417
Totals	57,092	$169,877	722,106	$1,858,995

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	3,320,461	$1,411,517	35,317,552	$20,629,278
Balata	17,129	7,650	369,750	208,326
Gutta percha and rubber substitutes and scrap	.....	.....	158,637	29,206
Rubber manufactures	.....	27,291	.....	139,223
Totals	3,337,590	$1,446,458	35,845,939	$20,996,133

Exports of Domestic Merchandise

MANUFACTURED				
India rubber				
Reclaimed	1,139,713	$120,821	10,675,472	$1,276,439
Scrap and old	3,495,719	234,048	26,875,413	1,742,926
Footwear				
Boots *pairs*	124,921	282,950	884,116	2,090,029
Shoes *pairs*	120,543	138,457	1,389,863	1,362,740
Canvas shoes with rubber soles *pairs*	325,974	222,349	5,180,781	3,773,500
Rubber water bottles and fountain syringes *number*	21,668	14,411	254,198	184,852
Rubber gloves *doz. pairs*	6,348	20,125	61,687	220,785
Other druggists' rubber sundries	.....	31,302	.....	456,542
Bathing caps *doz.*	2,414	6,542	146,032	326,661
Hard rubber goods				
Electrical hard rubber goods	137,494	28,503	773,804	260,999
Other hard rubber goods	.....	27,772	.....	371,881
Tires				
Casings, automobile *number*	152,983	2,025,175	1,344,423	22,313,180
Tubes, automobile *number*	111,507	287,668	1,036,480	2,818,135
Other casings and tubes, *number*	7,701	17,363	68,012	210,424
Solid tires for automobiles and motor trucks *number*	8,852	267,537	89,741	3,168,879
Others	146,339	36,430	1,423,254	468,878
Tire accessories	.....	141,208	.....	1,494,606
Rubber and friction tape	112,931	35,497	986,872	323,929
Belting	361,795	230,822	3,662,457	2,372,952
Hose	482,795	193,518	5,535,684	2,294,092
Packing	176,091	90,160	1,891,349	969,090
Soles and heels	399,829	126,725	3,822,002	1,215,507
Thread	147,717	183,024	1,366,157	1,830,071
Rubber bands and erasers	63,132	50,517	613,189	495,019
Other rubber manufactures	.....	178,748	.....	2,236,269
Totals	.....	$4,991,612	.....	$54,278,385
Rubber toys, balls and balloons	.....	$90,055	.....	$783,426

Interesting Letters from Our Readers

A Refutation

TO THE EDITOR:

DEAR SIR: The inventors of the Emka-process (British Patent No. 236,897) have distributed a pamphlet, in which I am mentioned with persons willing to give information on this subject. From the appearance of my name in this pamphlet, which has happened without the writer's knowledge and consent, it might be concluded that I am already convinced of the importance of this process.

However, I wish to point out that the information at hand is insufficient to consider whether this process is of practical value indeed.

J. G. FOL,
Propaganda Secretary International Association for Rubber and other Cultivations in the Netherlands Indies.

THE HAGUE, January 4, 1927.

The Rubber Exchange of New York, Inc.

First Annual Dinner

TWO HUNDRED AND FORTY members and guests of The Rubber Exchange of New York, Inc., participated in the first annual banquet that was held at the Roosevelt Hotel, New York, N. Y., on February 15, 1927.

Francis R. Henderson, president of the Rubber Exchange, was toastmaster, and the speakers were: Honorable A. Harry Moore, governor of New Jersey; Honorable J. Joyce Broderick, C. M. G. commercial counsellor to the British Embassy; Arthur W. Loasby, president, The Equitable Trust Co. of New York; and Robert Emmet Keene. The program was broadcast over WRNY.

Following the dinner Mr. Henderson defined briefly what the Exchange had accomplished during the past year, and saying in part:

In our year ending today, there were 62,704 contracts dealt in on the Rubber Exchange, equalling 156,760 tons of rubber valued at $170,000,000 in round figures, the actual deliveries amounting to 14 per cent of the total transactions. I am particularly proud of the percentages of deliveries, as it proves the flexibility of our contract and the workability of our rules governing deliveries. We have tried to make the Rubber Exchange a place where those interested in rubber may have price insurance and, if desirable, take physical delivery of the rubber and be protected. The Clearing House has functioned in a most orderly fashion and is financially sound.

Like other successful exchanges, the Rubber Exchange is founded on sound principles, affording opportunity to those who wish to put their dollars and cents into a market based on their idea of commodity values. Speculation, gentlemen, is just as sound as any business that ever was conducted in the world. Many people say that an exchange will promote gambling. An exchange that is not properly organized or conducted, or does not enforce its rules may promote gambling.

But I say to you, I am just as certain that the Rubber Exchange, as well as the Cotton Exchange, the Produce Exchange, and the Coffee and Sugar Exchange, so organized and conducted as they are, will prohibit gambling and promote honorable speculation, which in my judgment, and I think in the judgment of all those best qualified to know, is for the best interests of those dealing in any commodity.

As I look back to my many years of experience in the rubber industry I think of what we have been up against without an exchange. We have had markets indicating high prices and everyone of us scrambled to buy rubber. Every manufacturer in the United States was wondering whether he should buy, and in most cases would buy because he figured that he should not be left behind. But that only meant piling up the price.

And what has been the result? We have had fluctuations that have ruined companies, and prevented payment of dividends to stockholders.

And on the other hand when rubber prices were high everybody was a seller because it was not reasonable to expect prices ruling at the time to hold; and the same thing has happened with all sellers and no buyers, and the bottom has dropped out of the market, with no resistance, no cushion.

I maintain that a speculative market in any commodity is a cushion and a brake on any such operation, be it up or down, and I am certain as I have been for many years past, and particularly so in the last year, that the Rubber Exchange has served a real purpose.

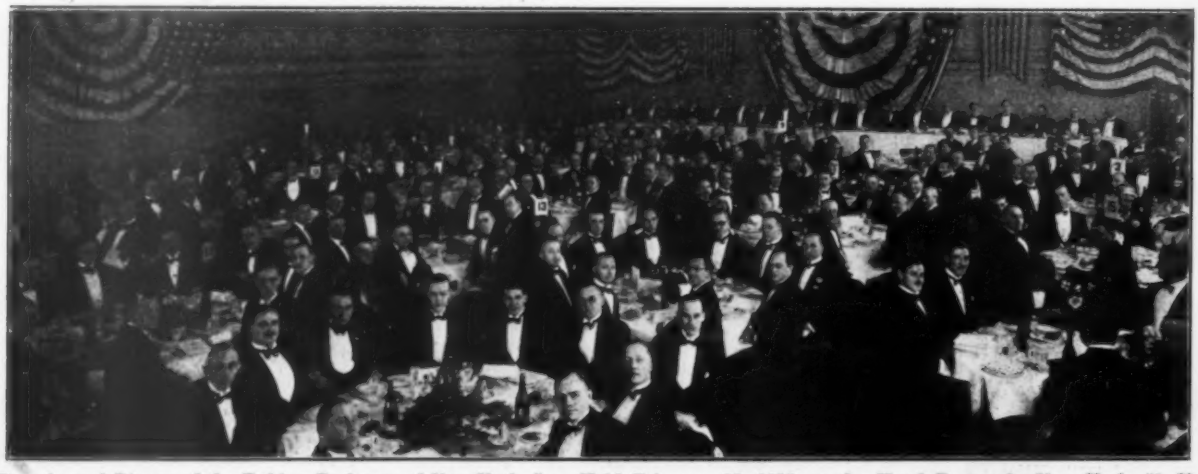
I feel confident there is a definite hope for stabilization in rubber, a narrow range of price where the plantation may live and the consumer may live and that the industry may go on and rubber will find its continued and increasing use in all parts of the world.

Let us give consideration to the hardships in the industry in the past. Let us give consideration to what we are all trying to correct in the present, and let us look forward with hope, and may the Rubber Exchange be a real basis of hope—I am certain that it will be! It cannot grow rubber. It cannot produce rubber. It cannot buy rubber. But it can offer the means of trading in rubber safely that a man may not lose if he is right, and if he loses when he is wrong he won't lose more than the market indicates.

Toastmaster Henderson then introduced A. Harry Moore, governor of New Jersey, who delivered an address replete with humor, pathos and casuistry that was typical of this clear thinking orator.

The next speaker, J. Joyce Broderick, commercial counsellor to the British Embassy, said that the object of rubber restriction was preservation of an important industry, and that genuine efforts have been made to eliminate uncertainties in the plan and make it more rapidly responsive to wide price fluctuations.

Arthur W. Loasby, president of the Equitable Trust Co., of New York, spoke of the relation of exchanges to the banks, and said that the Rubber Exchange was a great step forward. All business is a speculation, he said, and the more we can do to eliminate the speculation and get business down to a normal basis where a man is not a millionaire one day and a pauper the next, the better off we will be. Robert Emmet Keene, the well known entertainer, closed the evening in a fitting manner with his inimitable stories of wit and humor.



First Annual Dinner of the Rubber Exchange of New York, Inc., Held February 15, 1927, at the Hotel Roosevelt, New York, N. Y.

ehind.

s that
ds to

ybody
ing at
ellers
with

is a
and I
rly so
pur-

ubber,
con-
will
world.
n the
rrect
the
will
annot
afely
he is

gov-
with
hink-

ellor
ction
ef-
and

., of
and
All
o to
rmal
the
well
his

Y.